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Professional learning

John Graham

A central purpose of the AEU's professional journal – *Professional Voice* – is to promote professional learning through critical debate and the discussion of current issues in education. It parallels journals from practitioner organisations (unions or professional associations) in other professions such as medicine, engineering and law. The articles and interviews in our journal are selected because the contributors have something important to say to teachers and principals as professionals working in public education. Each article is intended to create a dialogue with the reader whose ideas and understandings are extended or challenged or reinforced (or all of these) as part of the continuous learning process which helps to define professional work.

The title of this edition of *Professional Voice* refers both to this generic purpose of the journal – which all of the articles contribute to – as well the more specific focus on teacher professional learning in the lead article and comment on it in several other contributions. The phrase "professional learning" is gradually overtaking the more familiar "professional development" in schools. While they are often used interchangeably, there is an ambiguity in the term "development" and it can have negative connotations implying a staff deficit requiring remediation. The more neutral, and accurate, "learning", verbally links the process of teacher learning to its fundamental purpose – the improvement of student learning. It is a better fit with the idea of schools as learning communities for all of those involved in them.

Providing effective professional learning for teachers has some similarities and some differences with what teachers know about enabling effective learning for their students. For example, the following learning principle would seem to apply to both teachers and students:

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> *People come to learning with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught or may learn them superficially and revert to their preconceptions in real situations.*[i]

On the other hand, teachers as 'learning experts' and adults have a different experiential mindset when they participate in professional learning:

> *Professional learning can ask a lot of teachers in the interest of their students. Even those who are confident in their professional role can feel profoundly uncomfortable when what they hold to be true is challenged and they have to rethink their beliefs and practices. This is particularly so because teachers are adults who have well-defined and defended schema about the way the world works.*[ii]

Reading an article in a professional journal has been described as "informal and incidental" professional learning. However in Victoria it is now recognised as a "professional practice" activity which can be documented and counted towards the requirements to maintain professional registration. The Victorian Institute of Teaching (VIT) defines such activities in terms of answering the question: "How does this activity contribute to my professional knowledge and how will I apply that knowledge to my practice to support the learning of my students?" The VIT also refers specifically to the "expansion of knowledge through reading and research" being counted for renewal of registration when it is consequent upon delivering professional development to colleagues.

In their major study of teacher professional learning Helen Timperley, Aaron Wilson, Heather Barrar, and Irene Fung from the University of Auckland wrote about two 'black boxes' which needed to be unpacked. The first was the connection between the acts of teaching and associated student outcomes and the second was the connection between professional learning opportunities and their impact on teaching practice. The lead article in this edition of *Professional Voice* uses a meticulous research methodology to provide insight into the second of these complex questions. Mary Kennedy, a professor emeritus of education at Michigan State University, describes her literature study of what works in professional development. She found that only a relatively small number of articles and reports provided sound evidence about the PD programs they studied. By "sound" she means they measured student learning after the program was finished and they compared these teachers' classrooms to comparable classrooms elsewhere.

Kennedy found that the differences in pedagogy used in the various study programs were a key variable in explaining why some programs were more effective than others. She concluded that "situated problem solving", which involved teachers in group discussion and analysis of teaching situations, was the *only* pedagogy that helped teachers learn and change their practices. This is a substantial finding which raises questions about the pedagogies which are still dominant in a number of high profile professional development programs in Australia. Two other findings of real interest were, firstly, that the evaluation of the impact of professional learning programs should not end when the program ends but be continued into the following year as changes to teacher practice as a result of professional learning were incremental and continued over a longer period. Secondly, smaller programs seemed to be more beneficial than larger ones and this may be because the effective pedagogy for professional learning is more able to be implemented in smaller sized groups.

Stephen Dinham's article is a summary of the comprehensive research he has carried out into the strategies and approaches which have the greatest impact on student learning. This is a follow-up to his article in the previous edition of the journal where he wrote about common classroom practices which lack a convincing research base. He identifies professional learning as one of the four "fundamentals of student achievement" along with a focus on the student (both as learners and people), leadership, and quality teaching. He uses the effect size research of John Hattie to establish the impact of professional learning. Hattie's typical effect size (impact) of different influences, interventions and innovations on student learning is 0.40. He estimated professional development to be 0.50, micro-teaching 0.88 and formative evaluation and feedback to teachers 0.90.

Dinham identifies student feedback as a 'silver bullet' for improving student achievement because it not only has a major impact (0.75 effect size) but there are so many opportunities to provide it. He believes the weak spot in feedback is the capacity of teachers to usefully respond to the student question 'How can I do better?' Rather than being "coaches" teachers often act more as "referees" - they are able to tell students when they are right or wrong, but not how to improve. The article outlines a school-based professional learning process to assist teacher understanding of the nature of productive feedback and to improve their capacity to deliver it.

The focus of Michael Fullan's interview is public school improvement and the role of school leadership in that process. He has written extensively about both of these matters. He sees professional learning as an essential leadership component in any improvement strategy. Principals maximise their impact by becoming "lead learners". This means they

> *...participate as a learner in working with teachers to move the school forward together; lead and learn in equal measure (you can't lead if you are not learning); and spend your tenure in any school (say for five or six years) developing a collaborative culture to the point where you become dispensable!*

When principals take on the role as instructional leaders in their school their focus should be on being learners rather than the boss. They influence the instructional practice of teachers through teachers. The payback when they do this is clear-cut: "The more you learn the more influential you become". Fullan has much to say about how the relationship between school leaders and the system should work. He encourages them to see their relationship with the system bureaucracy as a two way street rather than one of compliance and says that in his experience "toeing the line is not a good job description". Principals should be assertive but at the same time they should increase their participation as a learner with teachers. The result will be that they become more empowered and appreciated by both teachers and system leaders.

The other four articles in this edition are linked to professional learning in the generic sense of the journal's purpose – expanding knowledge, supporting research, and discussing issues and ideas that count. Sue Thomson, a research director from ACER and National Manager of the PISA testing program, uses PISA data to peel back the layers of inequity in Australia's schooling system. The data reveals a very uneven playing field where student achievement is heavily influenced by family background and school resourcing. She thinks the much discussed PISA performance decline of Australian students will only be reversed when these equity issues are properly addressed.

Peter Johnson writes about a relatively unexplored area of study - the number and importance of Aboriginal and Torres Strait Islander teachers in Australian schools. He documents the significant national gap (2012) between the proportion of Indigenous students (4.9%) and the proportion of Indigenous teachers (1.7%). In Victoria (2015) 0.1 per cent of teachers identified as Aboriginal and Torres Strait Islanders compared to 1.5 per cent of students. Johnson cites various research studies which emphasise the benefits for Indigenous students of being taught by Indigenous teachers.

The Shepparton Neighbourhood Schools Project was established to address the complex therapeutic needs of a growing cohort of disadvantaged children in Shepparton primary schools. The innovative project is led by a local paediatrician, Peter Eastaugh, and a group of primary principals. The project developed a process for identifying and assessing children with significant learning and/or behavioural challenges and linked them to a

therapeutic intervention known as Child Centred Play Therapy, partially funded by State Government Equity Funding.

Andrew Fuller and Vicki Hartley describe the complexities of our brain systems and how they affect our learning and our actions. The authors outline an approach they refer to as Neurodevelopmental Differentiation (NDD) which is used to help students increase the effectiveness of each of their brain system areas and find ways for them to succeed by compensating for areas that are taking longer to develop. The value of this approach, which combines research on brain systems with research on learning, is that it opens up new pedagogical possibilities for teachers faced with the wide range of student needs and developmental stages found in most classrooms.

Notes

i Lorna Earl (2007), in *Teacher Professional Learning and Development*, Helen Timperley, Aaron Wilson, Heather Barrar, and Irene Fung, NZ Ministry of Education, p.viii **http://www.oecd.org/edu/school/48727127.pdf**

ii Ibid

How can we foster professional learning?

Mary Kennedy

Professional Development is widespread in education, perhaps more so than in most other fields. In the United States, it is incorporated into almost all teaching contracts and teachers may participate in multiple PD programs every year. But despite our widespread reliance on professional development, *Professional Learning* is less widespread.

So what is the problem? Perhaps the biggest problem is that we lack a clear knowledge about how PD programs work. Though hundreds of articles are written every year about professional development, most are advocacy pieces, lacking hard evidence. Over the past few years, I have examined this literature and found only 27 articles that provided sound evidence about the programs they studied. By "sound," I mean they measured student learning after the program was finished and they compared these teachers' classrooms to comparable classrooms elsewhere. In this article, I describe what these studies tell us.

Not surprisingly, the programs themselves were quite various, and so were their outcomes. So I wanted to learn which differences made a difference to teachers. For instance, one difference was that they addressed different topics. Some focused on subject matter knowledge, some on classroom management, some on methods of fostering discussion, and so forth. Another difference is that they used quite different pedagogies. Some simply presented their ideas in lectures or handbooks while others demonstrated specific practices and still others engaged teachers in analysis of teaching artifacts such as videotapes of lessons or samples of student work.

The first thing I learned was that the various *topics* they taught were roughly equal in their benefits to teachers. So we know that teachers can benefit from learning more about

Mary M. Kennedy is a professor emeritus of education at Michigan State University. Her scholarship focused on defining teacher quality and identifying the factors that most influence teacher quality. She examined the influences of teacher education, research knowledge, attitudes and beliefs, credentials, and school context. From 1986 to 1994, she directed the National Center for Research on Teacher Learning. Kennedy consulted with four ministries of education, the World Bank, and a host of national organizations. She has also published four books on these issues and has won five awards for her work, most recently the prestigious Margaret B. Lindsey Award for Distinguished Research in Teacher Education.

almost any topic. This should not be surprising because teaching is a multi-faceted activity and draws on knowledge about lots of different things, including things like how to use software, how to fix electrical outlets, how students learn, what motivates students, how to organize group work, or more about geography, history, reading, mathematics, etc.

But the second thing I learned was that the differences in pedagogy made a big difference to teachers. Some pedagogies fostered more learning and more changes in practice than others did. Of course, to figure this out, I had to sort the programs into some sort of categories. Here are the three categories of pedagogy formed:

- *Presentation.* This is the oldest and most widely-recognized method of sharing new ideas. We write them down in manuals, handbooks or textbooks, we present them in lectures with intermittent question-and-answer sessions or small group discussions. For example, one program focused on research-based methods for teaching reading. The presenters identified five primary findings from research and then provided teachers with five seminars, distributed across the school year. Each seminar was also accompanied with a text, or manual, that laid out all the details about that particular approach to teaching reading.
- *Prescription.* The second group translated their ideas into a set of practices that they could not only describe but also show. This group of programs often relied on classroom observation instruments to describe the specific practices they felt teachers should use. They also used these instruments to observe teachers and give them feedback on how, or how well, they were implementing the recommended practices.
- *Situated Problem Solving.* In the third approach, teachers meet in small groups to discuss and analyze artifacts of teaching such as videotaped lessons, examples of student work, or teachers' own lesson plans. The discussion leader would raise questions and offer new insights to help teachers make sense of the things they were examining, including curriculum units, lesson plans, student behaviours, etc.

Don't forget that I reviewed 27 studies, so I actually have multiple tests of each of these pedagogical approaches. And the studies themselves are also quite various. For instance, within one of these three approaches, I might find one study focusing on 40 secondary science teachers, another focusing on 600 first grade teachers, and yet another aimed at middle school bilingual teachers. So the topics and grade levels can be quite various even though they all rely on a common pedagogy to achieve their goals. As I said above, the *topics* seemed equally useful but the *pedagogies* had visible differences in their effects. Specifically, the third pedagogy, which consisted of situated problem solving, was the *only* pedagogy that actually helped teachers learn and change their practices.

I have a graph here that illustrates the differences among these programs, though it is a bit hard to read. Each "bubble" in the chart represents a unique study of a unique PD program. The actual effectiveness of the program is reflected by how high the bubble is on the graph. Bubbles at the bottom had zero benefit for teachers. Even after participating in these programs, teachers were no more effective than other teachers who did not participate. The higher the bubble, the more different participating teachers were from other comparable teachers who did not participate. Other aspects of the bubbles reflect the program size and the amount of time they spent with teachers, as explained beneath the figure.

Figure 1: Effectiveness of different approaches to Professional Development

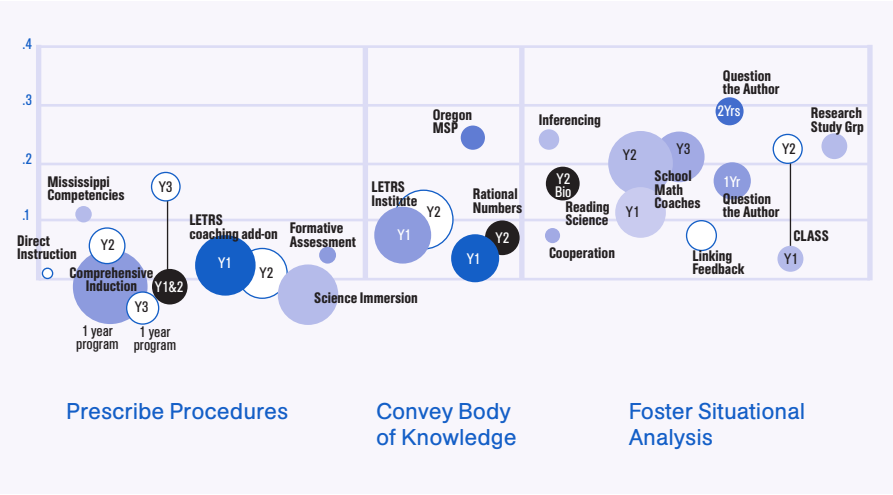


Chart Variables

- Each bubble represents a particular program effect in a particular year. Bubbles clustered together with labels like Y1 and Y2 represent the same program across different years.
- Size of bubbles represents the number of people in the program. Larger bubbles mean larger groups of teachers participated.
- The darkness of bubbles represents the number of hours spent by teachers in the program. The darker the bubble the more contact hours. e.g. The year 2 white bubbles means that the evaluation of the effects of the programs on participating teachers continued in the following year after the program had stopped.
- The position on the chart represents how effective the programs were. Bubbles located in the upper half of the picture indicate that their programs were more effective than those at the bottom.
- The three divisions of the chart represent the different forms of pedagogy used in the programs ie prescribe procedures, convey body of knowledge, foster situational analysis.

Here are some patterns that I see in this graph, along with some hypotheses for why these patterns appear.

1. Pedagogy Matters

I sorted the full set of program bubbles according to their reliance on the the three pedagogies I described above. The group on the left depicts results of programs that focused on procedures, and you can see that nearly every bubble rests on the baseline, which represents zero difference between participating teachers and their comparison teachers. In the middle of the figure are programs that presented new knowledge. Their bubbles are a little higher on the chart. Finally, on the right are bubbles representing programs that engage teachers in group discussion and analysis of teaching situations.

This third group has the highest bubbles even though their methods and content were quite various. Some analyzed student behavior in videotapes, some analyzed student homework, some analyzed interactions between teachers and students, and so forth.

I have a hypothesis about this. I suspect that the reason the two less effective pedagogies are less effective is that they try to give *universal solutions* to a practice that necessarily depends on unique situations. It is one thing to say that, as a general rule, students are more motivated when they have choices, but it is another to say that Donald, third seat on the left, will be more motivated or will make constructive choices if he is provided with them.

Everything teachers do depends on the situation. The question you pose to motivate a discussion depends on the topic and depends on who your students are, and sometimes even on whether the lesson is before or after lunch. Many decisions are influenced by one particularly difficult student. Each lesson presents a new and unique combination of content, materials, students, time constraints, school policies and so forth, and the decisions teachers make are based on simultaneous consideration of all of these things. This is why universal solutions don't work.

Professional developers who fail to acknowledge the "situatedness" of teaching fail to provide teachers with *usable* knowledge. The knowledge shared in manuals and lectures is essentially context-free. It is not linked to anything and thus easy to forget when teachers return to the unique situations they face in their classrooms. The universal practices that coaches often advocate are embedded in practice, but they are presented as if they were universally applicable and cannot be amended to adjust to specific circumstances. It may

be true that, in general, a particular procedure is valuable, but it does not follow that that will *always* be effective.

2. Learning takes time

There is another pattern in my graph that is worth thinking about. Notice that there are some bubbles that say "Y2" in them, and that these are always linked to other bubbles that say "Y1." The Y2 bubble represents the second year of the study. Often these bubbles are white, meaning there was no program activity during the second year, but that researchers followed teachers for a second year to see if they retained what they had learned during the first year. In most cases, teachers not only retained what they learned, but improved their practice during the Y2 year.

I have a hypothesis for this as well, and it also has to do with the complexity and "situatedness" of teaching. Teaching is a practice that is improved by increments. Teachers are constantly adjusting and adapting, tweaking and tinkering with their classroom systems. Even when they gain useful ideas from a PD program, it still takes time to translate it into their own unique situations. Thus, even if their practice improves during the first year of the program, it is very common for it to improve even further the next year, as teachers continue to discover new ways of incorporating these ideas into their own situations.

3. More contact time does not necessarily mean more learning.

When bubbles in my figure are darker, it means that the program spent more time, or more "contact hours" with teachers. Conversely, lighter bubbles mean fewer hours together. A common assumption among teachers and researchers is that the more time we spend on a unit, the more students will learn from it. But this figure suggests that the relationship between time and learning is not very clear. In fact, there is a slight tendency for the lighter bubbles to rise above the darker bubbles. However, it is not clear that contact hours per se are responsible for the position of the bubbles, because the height of these bubbles may reflect the differences in pedagogy more than differences in contact hours per se.

4. Smaller programs seem to be more beneficial

The size of the bubbles in my figure reflects the size of the programs. Larger bubbles may have served a hundred teachers or more, and a smaller one may have included only 20 or 30. Notice that there is a slight tendency for smaller bubbles to rise higher than larger bubbles, meaning that programs serving smaller groups of teachers might be more effective than very large programs. This pattern might also be tied to the pedagogies

that programs are using, for programs providing universal solutions have standardized messages and so are easier to share with larger populations. Programs that aim to engage teachers in analyses of real situations tend to work with smaller, more intimate groups of teachers.

Conclusion

If you are a professional developer, these findings might seem disappointing. They suggest that very few programs actually make a difference, and that those that did make a difference had to be of limited size in order to establish intimate learning communities. But if you are a teacher, these findings are optimistic, for they suggest that small, local groups of teachers who meet regularly within their own schools to analyze their own situations might be able to gain new insights and make valuable improvements without great expense and without depending on external supports. In the Appendix to this paper, I include short descriptions of some of these programs, focusing especially on what groups do when they share and compare, in the hope that readers might find useful self-help ideas here.

Appendix: Illustrative Programs in Each Group

Prescribed Procedures

Science Immersion

The Science Immersion program was designed to introduce a new science curriculum to teachers in Los Angeles. Though the curriculum was intended to encourage exploration among children, its instructions for teachers were highly prescriptive and detailed. A manual for a single unit could be as long as 200 pages. Here is a sampling of instructions for a single lesson:

1. *To set the tone for this investigation as an exploration, generate a class discussion and class list about what plants need for growth and development.*
2. *Use the Think Aloud technique to model how to refine a wondering into a good scientific investigation. From the students' list about what plants need, form the question—What effect does sunlight have on radish plant growth and development?*
3. *Continue the Think Aloud to model assembling the Terraqua Columns using proper experimental procedures, and designing an experiment that has only one factor that is varied.*
4. *Have students record and explain their predictions for each set of columns for later reference.*
5. *… (p. 21)*

Sources:

Borman, G. D., Gamoran, A., & Bowdon, J. (2008). *A randomized trial of teacher development in elementary science: First-year achievement effects*. Journal of Research on Educational Effectiveness, 1, 237–264. doi:10.1080/19345740802328273

Rot it right: The cycling of matter and the transfer of energy. 4th Grade Science Immersion Unit. (2006, September). System Wide Change for All Learners and Educators (SCALE) Report. Madison: University of Wisconsin–Madison. Retrieved from www.scalemsp.org

Comprehensive Induction

This program was designed for novice teachers. Local coaches used an observation rubric to observe and critique novices' practice, with an eye toward getting them to comply with the specific practices outlined in the observation instrument. The researchers examined both a 1-year version and a 2-year version of the program, and in each case followed teachers through a third year.

Source:

Glazerman, S., Isenberg, E., Dolfin, S., Bleeker, M., Johnson, A., Grider, M., & Jacobus, M. (2010, June). Impacts of comprehensive teacher induction: Final results from a randomized controlled study. Washington, DC: National Center for Education Evaluation. Retrieved from https://ies.ed.gov/ncee/pubs/20104027/

Providing Content Knowledge

LETRS Institutes

The acronym LETRS refers to *Language Essentials for Teachers of Reading and Spelling*. The program is based on research findings, specifically five practices that have been found by researchers to be especially effective. The program provided five day-long seminars, or institutes, one on each topic (e.g., phonemes, phonemic awareness, etc.), and each institute was accompanied by a textbook on that topic. Seminars were interspersed throughout the school year, each covering a single topic. Notice that there is also a LETRS program in my first category, of prescribed practices. This is because the researchers tested both models, one offering only knowledge and the other offering knowledge as well as coaching.

Source:

Garet, M. S., Cronen, S., Eaton, M., Kurki, A., Ludwig, M., Jones, W., Sztejnberg, L. (2008). *The impact of two professional development interventions on early reading instruction and achievement.* Washington, DC: National Center for Educational Evaluation and Regional Assistance, Institute of Education Sciences. Retrieved from **http://ies.ed.gov/ncee/pdf/20084030.pdf**

Rational Numbers

The Rational Numbers also provided intermittent institutes in a format very similar to the LETRS program. Each institute included lectures and overheads interspersed with opportunities for teachers to solve mathematical problems, explain how they solved problems, discuss student misconceptions about these topics, and plan lessons that they would teach later on. The program also included a modest supplemental component to help teachers apply their new knowledge to their classroom instruction.

Source:

Garet, M. S., Wayne, A. J., Stancavage, F., Taylor, J., Eaton, M., Walters, K., ...Doolittle, F. (2011). *Middle school mathematics professional development impact study: Findings after the second year of implementation.* Washington, DC: U.S. Department of Education. Retrieved from **http://ies.ed.gov/pubsearch/pubsinfo.asp?pubid=NCEE20114024**

Analysis of Specific Teaching Situations

Research Study Group

Study groups were formed among elementary reading teachers. Each group read articles about research findings relevant to teaching reading. In their meeting, they discussed their newest reading, then they tried to incorporate the findings into their forthcoming lesson plans. Each meeting began with a review of the results of their past efforts, then moved to a

discussion of the next reading, and each closed with new lesson plans which they would try next. This program offers a unique opportunity to compare programs with similar content. The content here was very similar to that of the much-larger LETRS program which tried providing knowledge alone as well as knowledge combined with procedures.

Source:

Gersten, R., Dimino, J., Jayanthi, M., Kim, J. S., & Santoro, L. E. (2010). *Teacher study group: Impact of the professional development model on reading instruction and student outcomes in first grade classrooms.* American Educational Research Journal, 47, 694–739. doi:10.3102/0002831209361208

CLASS

Teachers received an orientation to the CLASS observation instrument. They then videotaped their own classrooms every two weeks and sent their videos to an on-line consultant. The consultant then called them for a telephone discussion. In their conversation the consultant did not ever tell the teacher what s/he should have done, but instead asked questions about why she did something, or how did she know when to move on. These questions pushed the teacher to think more about her own strategies and her own use of evidence during teaching.

Source:

Allen, J. P., Pianta, R. C., Gregory, A., Mikami, A. Y., & Lun, J. (2011), *An interaction-based approach to enhancing secondary school instruction and student achievement.* Science, 333, 1034–1037. doi:10.1126/science.1207998

School Math Coaches

Math coaches were assigned to individual schools to help teachers improve their lessons. The coaches did not prescribe any particular practices or directly teach any mathematical content. Instead, they worked beside teachers, joining existing grade-level team meetings, co-planning lessons with teachers, and even co-teaching lessons with teachers. These joint activities enabled coaches to introduce new insights about student learning and also about the content itself, always within the context of specific curriculum units and specific students.

Source:

Campbell, P. F., & Malkus, N. N. (2011). *The impact of elementary mathematics coaches on student achievement.* Elementary School Journal, 111, 430–454. doi:10.1086/657654

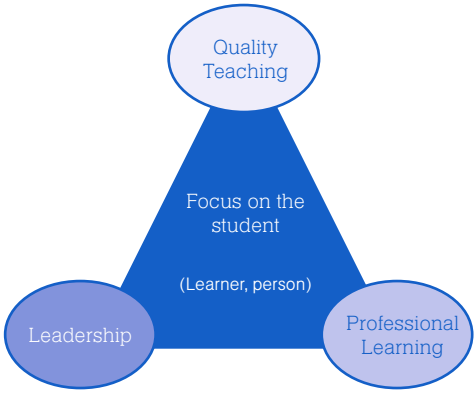
Fundamentals of student achievement

Stephen Dinham

Editor's note: This is a follow-up to Stephen Dinham's article in the previous edition of Professional Voice where he wrote about what doesn't work - current classroom practices which, while in common use, lack a convincing research base. In this article he describes what does work - those strategies and approaches that have been found to have the greatest impact on student learning.

At the conclusion of my book *How to Get Your School Moving and Improving* (Dinham, 2008a) I presented a simple, powerful model for what I had observed in classrooms of successful teachers, successful school subject departments, cross-school working groups, successful schools and education systems across Australia and overseas.

Figure 1: The four fundamentals of student achievement



Stephen Dinham is Professor of Instructional Leadership and Associate Dean (Strategic Partnerships) in the Melbourne Graduate School of Education, the University of Melbourne. He has over 40 years of experience as a teacher, university academic, researcher, writer and consultant. He has conducted a wide range of research projects in multiple areas of education including leadership and change, effective pedagogy, student achievement, teaching standards and teachers' professional development.

1. A central focus on students, both as learners and people

a) *The individual learner* - In terms of learning, each student's progress is assessed formatively, and summatively, and teachers are aware of where each student *has been* in terms of their learning, *where they are* at present in terms of what they can and can't do in respect of the standards and expectations held for them, and *what is needed* to move their learning forward. Constructive feedback and appropriate teaching strategies are part of the ongoing assessment of each student. Hattie (2012) has calculated an effect size of 0.54 for student-centred teaching and 0.75 for teacher to student feedback, underlining the importance of knowing students as learners and acting on this knowledge.

b) *The individual person* - The second aspect of this central focus is that every student is also known as a person. Hattie has calculated an effect size of 0.72 for teacher-student relationships. It is important that every student feels that there is someone who knows and cares about them. Some students can go weeks or longer without such personal contact or interest, particularly those students who don't stand out or draw attention to themselves because of their learning, conduct or other factors. Effective teachers find ways to communicate and connect with all their students. They know and use students' names and offer commendation or correction when appropriate. They keep records. They notice changes in a student's engagement, enthusiasm, work or even health, and intervene before small problems become bigger.

However, sometimes there is a lack of relative balance between knowing students as learners and as people. In some schools the emphasis is more on the learning side. The school prides itself on the academic success of its students and those who don't measure up are ignored, put in a bottom class, or can go elsewhere. School newsletters, websites and notice boards outside the school advertise academic success as defined by Australian Tertiary Admission Ranks (ATARs) and how many students enter university.

On the other hand, other schools, usually of lower SES, have lesser expectations for their students. The language used here can be instructive. I have heard variations on all of these and more: 'Don't expect too much and you won't be disappointed'; 'This is a poor area and the best we can do is give our students the basics'; 'The local community doesn't value education'; 'The most important thing we can do is to boost students' self-esteem and make them feel better about themselves', and finally 'We are a welfare school'.

In my research it is clear that those schools that are most successful in terms of overall student achievement maintain that essential balance between 'academic' (learning) and 'welfare/well-being' (personal) aspects of schooling.

2. Professional learning

A second broad factor responsible for successful teaching, learning, schools and systems is professional learning. It is no coincidence that the most effective teachers, subject faculties and schools are never satisfied with what they know. They never reach the point where they feel they can put their feet up and say they have it all worked out. There are always new challenges and every year, new students. These educators continually question what they do and how and why they do it, use evidence to inform this knowledge, and are always on the lookout for new strategies, resources and approaches to improve teaching and learning. Hattie found professional development to have an effect size of 0.51 in respect of student achievement. Teachers utilising micro-teaching to improve their practice has an effect size of 0.88. Providing teachers with formative evaluation and feedback on their performance has an even larger effect size of 0.90. Robinson, Hohepa and Lloyd found from their meta-analyses that leaders 'promoting and participating in teacher learning and development' had a very large effect size of 0.84.

Professional learning – one of the 'big levers' at our disposal - is essential to teacher development and school improvement. I can't see how we can change what teachers know and can do without it. Any change we introduce into a school or system must be accompanied and supported by relevant and effective professional learning, if it is to have any chance of success.

3. Leadership

Leadership is another 'big lever' in improving teaching and learning. Our earlier views of leadership have changed and we now recognise that leadership resides in all teachers and not just in those occupying formal leadership positions. Every time a teacher takes a class, an extra-curricular activity, works with a less experienced teacher or sits on a school committee or working party, to give but a few examples, he or she is exercising leadership.

Leadership, as with professional learning, is a powerful enabler in schools. It is possible to have good teachers and teaching without having a successful school but in my experience it is impossible to have a successful school without good leadership. Hattie has identified an effect size of 0.39 for principals/school leaders but as I have noted elsewhere, the effects of leaders and leadership are often widely variable, indirect, and therefore more difficult to measure than those for teaching. Additionally, some forms of leadership, such as instructional leadership, have been found to have more effect on student learning than others, such as transformational leadership. Leadership is a group function which over time can lift a school's performance, but poor leadership can quickly undo this good work.

4. Quality teaching

Not surprisingly, quality teaching has been found to be essential in facilitating successful student learning. There are two sides to the quality teaching coin: the qualities of the teacher and the quality or effectiveness of his or her teaching. There has been great interest in the quality of those entering teaching in recent times (and with the quality of initial teacher education programs), as there has been for teaching performance or effectiveness. Hattie found an overall effect size of 0.48 for the quality of teaching, but research has also revealed the wide variation in teacher quality that can occur in any school. Whilst the teacher is the biggest *in-school* influence on student achievement, the big challenge is to get a quality teacher in every classroom, something I have described as being the biggest equity issue in education.

We now turn to strategies and techniques that *have* been found to be powerful agents for student learning.

Self-report grades

The highest influence of all on student achievement, according to Hattie's meta-analyses, was self-report(ed) grades, with an effect size of 1.44, an effect beyond very large and in the 'radioactive' category.

Hattie notes:

> *'Overall, students have reasonably accurate understandings of their levels of achievement. … [however]*
>
> *There are at least two groups that are not as good at predicting their performance and who do not always predict in the right direction: minority students and lower achieving students. … They tend to underestimate their achievement and, over time, they come to believe their lower estimates and lose the confidence to take on more challenging tasks. …*
>
> *Student reflection on their performance alone makes no difference. Emphasising accurate calibration is more effective than rewarding improved performance. The message is that teachers need to provide opportunities for students to be involved in predicting their performance; clearly, making the learning intentions and success criteria transparent, having high, but appropriate, expectations, and providing feedback at*

> *the appropriate levels … is critical to building confidence in successfully taking on challenging tasks. Educating students to have high, challenging, appropriate expectations is among the most powerful influence in enhancing student achievement.'*

I have developed and used the following approach to using self-report grades successfully with a range of teachers and school leaders across Australia, who in turn have used it with their students. I don't advocate that it be used for every lesson or activity, but experience has shown it is a powerful training, analytic and cognitive exercise. It requires both teachers and students to think about what they are doing and what success looks like.

There are six steps in the process:

1. *Carefully explain to students an assignment or learning activity, including key terms and directions* – This is always a good way to start and requires the teacher to be clear on his or her learning intentions. Checking for student understanding of key terms and directions is essential in this step. If students are unclear about what they have to do, poor performance is almost guaranteed.
2. *Provide students with the assessment rubric, including criteria and the marking/assessment scale/method for each item/criterion* – This step is about students having a clear idea of the expectations for the activity, the elements of what is required, and what acceptable performance looks like. Where students are unsure of the standard required, this can lead to confusion. Providing examples of unacceptable, acceptable and superior performance on a task can be powerful aids to successfully completing the task and to improvement. The old technique of 'compare and contrast' can be valuable here: 'Here are three examples of responses to 'x' … which is the best and why?'
    * Optional: Jointly discuss and determine criteria to be used with students.
3. *Students complete the activity (individually or in groups), using rubric as a guide* – This is the most powerful use of a rubric, to guide completion of a task rather than just assessing how a task or criterion of the task has been performed.
4. *Students assess their work using the rubric* – An interesting phenomenon sometimes occurs with this step – students can be quite self-critical (see Hattie's previous comments about minority and lower performing students) – in that some students will be 'harder' on themselves than is their teacher.
    * Optional: Students assess another student's work, discuss with student concerned.
5. *Teacher assesses each student's work, providing feedback using rubric* – It is important here that the teacher's assessments are *congruent* with the earlier instructions, the rubric and standards expected. For example, it is counter-productive

and 'unfair' (students have low tolerance for unfairness) to introduce additional criteria at this stage, i.e., 'I'm reducing your mark by 25% because your work is untidy', 'I'm taking off 5 marks because you were noisy', or 'I'm taking off 10 marks because I find you obnoxious', if these were not part of the original criteria/rubric.

6. *Student and teacher discuss/compare their assessments* – A most important step where discussion and moderation ('give and take') can occur. It is powerful if the teacher (and student) is prepared to listen to evidence and to be flexible, e.g., 'Yes, I think you are right, it is a B rather than a C'.
    * One-to-one conferences are powerful: As noted, the one-to-one 'face-time' conference between teacher and student is important in the teacher knowing the student as a learner and person, and vice versa, and for individualised feedback to be given.

In my experience, if you start to use this process with students, expect them to ask 'Will we get to assess our own work?' in the future. The lasting benefits include students (and teachers) thinking more deeply about an activity and checking for understanding, being more aware of required standards, using rubrics or criteria to guide the work, engaging in self-assessment prior to submission and assessment by the teacher, and constructive feedback, discussion and adjustment to assessment where necessary.

The importance of spaced practice

Another strategy with a large measured effect size (ES = 0.71) in respect of student learning is that of 'spaced' practice. Once again, some people seem to be ideologically opposed to the notion of practice, equating it with drills and rote learning. Spaced practice means structuring the learning experience so that students have the opportunity to receive instruction, perform a task, receive feedback to improve their performance and then complete the task again, rather than simply performing it once, i.e., 'mass' practice.

Reeves has noted in respect of practice:

> *'Research shows the value of deliberate practice across fields such as music to athletics: … children and adults need deliberate practice in order to achieve their objectives … The components of deliberate practice include performance that is based on a particular element of the task, expert coaching, feedback, careful and accurate self-assessment, and – this is the key – the opportunity to apply feedback immediately for improved performance.'*

Thus, if you are a soccer coach, you don't have your players practise soccer by playing a game of soccer. You isolate the essential, discrete skills and strategies (e.g., heading the ball, kicking the ball with either foot, where to position on corners, etc.), coach your players in these skills, let them perform the skill, give them constructive feedback – note the reference to self-assessment once again ('careful and accurate self-assessment') – and let them perform the task once more, i.e., engage in further 'spaced' practice. Then it might be time to play a game.

Feedback

Teacher to student feedback does not have the largest effect size of those strategies and approaches at our disposal (ES = 0.75), but in some ways it *is* a 'silver bullet', simply because there are so many opportunities for feedback, and in many cases, feedback is done so poorly.

I have noted:

> *'Look at learning or mastery in fields as diverse as sports, the arts, languages, the sciences or recreational activities and it's easy to see how important feedback is to learning and accomplishment. An expert teacher, mentor or coach can readily explain, demonstrate and detect flaws in performance. He or she can also identify talent and potential, and build on these.*
>
> *In contrast, trial and error learning or poor teaching are less effective and take longer. If performance flaws are not detected and corrected, these can become ingrained and will be much harder to eradicate later. Learners who don't receive instruction, encouragement and correction can become disillusioned and quit due to lack of progress.' (Dinham, 2008b)*

The issue of feedback has rightly received a lot of attention recently and there are various approaches, all worthy of consideration. Based upon my research experience, I believe there are four key questions students require answers to, if their learning is to move forward:

The four questions of Students:

1. What can I do?
2. What can't I do?
3. How does my work compare with that of others/the expected standard?
4. How can I do better?

Keeping in mind the dangers of 'entity thinking' where students can come to see their abilities as fixed (Dinham, 2017), students need to know what they can do *at the present time* ('ticks') and what they can't do ('crosses'), again, at the present time and not for all time. For many students, this is where feedback begins and ends, and has little impact, at least of a positive nature, on learning.

'How does my work compare with that of others?' is really about the standards expected for the student at his or her stage of schooling. It is more than just position in the class or year, and has the potential to be useful, especially if a technique like self-report grades is employed.

However, the most important question and answer, and one that in my experience students rarely receive, is 'How can I do better?' This is where constructive feedback that assists the student to improve his or her performance needs to be provided. I have had teachers say to me 'I can tell them when they are right, and I can tell them when they are wrong, but I find it hard to tell them how they can improve'. If that's the case, then you are more a referee (assessor) than a coach (teacher).

Here is a powerful, instructive quote from a 14 year old student (Glasson, 2009):

> *'I really hate it when you wait for weeks to get back some piece of work and then it says 'Well done. B', and there are a few scribbles here and there.* ***You don't know what you're supposed to do to get any better.*** *' [Emphasis added]*

A structured approach to considering feedback

In working with teachers, schools and university faculties, I have successfully used the following process to begin a productive, professional conversation about feedback (Dinham, 2008b):

1. *What are our present approaches – formal and informal – to student feedback? Conduct an audit.*
2. *Are our assessment methods and criteria clear, valid and reliable? Identify the links between assessment and feedback.*
3. *Do our students understand what is meant by feedback?*
4. *Is the feedback our students receive infrequent, unfocused, unhelpful, inconsistent or negative? – OR -*
5. *Is the feedback we provide focused, comprehensive, consistent and improvement-oriented, addressing the four key questions raised above? (especially How can I do better?).*
6. *How does the feedback our students receive relate to parental feedback through reports, interviews and parent-teacher nights? Is feedback to students and parents consistent?*
7. *How can we provide our students with improved feedback?*
8. *How will we know if it works? What evidence will we need?*

The answers to the above questions will provide an important foundation for improving the quality of teaching and student achievement in our schools. However, we need to consider a cautionary note. *Feedback is only one part of the equation. It is not a substitute or remedy for poor teaching.*

Concluding remarks

We have considered the key question of what works *best* in teaching. A strong thread running through the discussion has been the need for teachers to be critical consumers of research and to be evidence-based in their practice, both in respect of evidence informing what they do, and in respect of generating evidence of their students', and therefore, their success.

We need to concentrate on the strategies and approaches that have been found to have *most* impact on student achievement, and to question and disregard practices that not only have been found to be ineffective, but in some cases are known to be harmful (Dinham, 2017).

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The effects of inequity in Australian schools

Sue Thomson

The data released every three years from the OECD on results from the Programme for International Student Assessment (PISA) is mostly reported in the press as rankings and 'who beat who'. However, it is not particularly helpful to use an overall country mean to determine where we need to direct our attention to improve learning, particularly in a country like Australia where the primary responsibility for education lies at the state and territory level. Instead, we need to carefully disaggregate the data and consider, among other things, the social and economic factors that influence performance across states and between schools.

Socioeconomic background

The relationship between socioeconomic background (SES) and student achievement is well-established, with a vast body of literature showing that more advantaged students tend to do better in school than disadvantaged students. Also well-established is the relationship between a school's socioeconomic background, defined as the aggregated measure of the socioeconomic backgrounds of the students within the school. In all PISA studies, in most countries, academic outcomes tend to be more strongly associated with school SES than with individual students' SES, although both are important. Figure 1 shows the relationship between science achievement and student socioeconomic background (SES) for Australian students in PISA 2015. The difference between the average low SES student and the average high SES student is 91 score points. This represents almost three years of learning.

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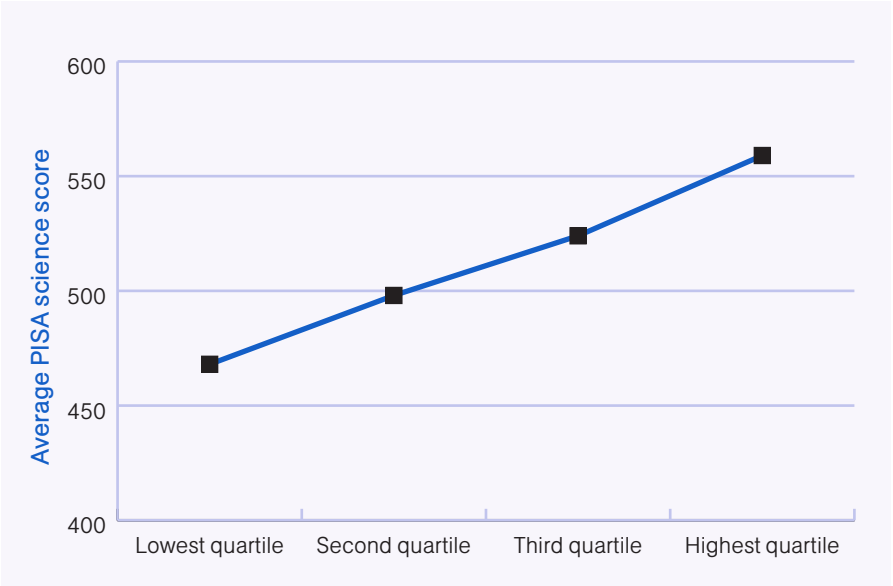

Figure 1. Relationship between student socioeconomic background and science achievement, Australia, PISA 2015

However, we know that not all schools are the same – and that not all children attend schools that reflect their own socioeconomic background. Higher SES students still come to school with a higher level of resources than low SES students do, both in terms of physical resources and in less tangible resources such as parental support and involvement. Thus it would be helpful to look at the achievement of students in three broad groups of schools: low, average and high average SES[1].

Figure 2 shows the relationship between science achievement and socioeconomic background at both student and school level. Clearly the school a student attends matters. For an average disadvantaged student, the difference between attending a disadvantaged school versus an advantaged school is 56 score points. For the typical average achieving student, the difference between attending a disadvantaged school versus an advantaged school is 64 score points. For both groups, this average is statistically and substantially below the OECD average, and would place these students' achievement with that of students from far less developed countries.

For advantaged students there is a 71 point penalty for attending a disadvantaged school, bringing average achievement down from around the average of the highest performing country, Singapore, to that of the OECD average.

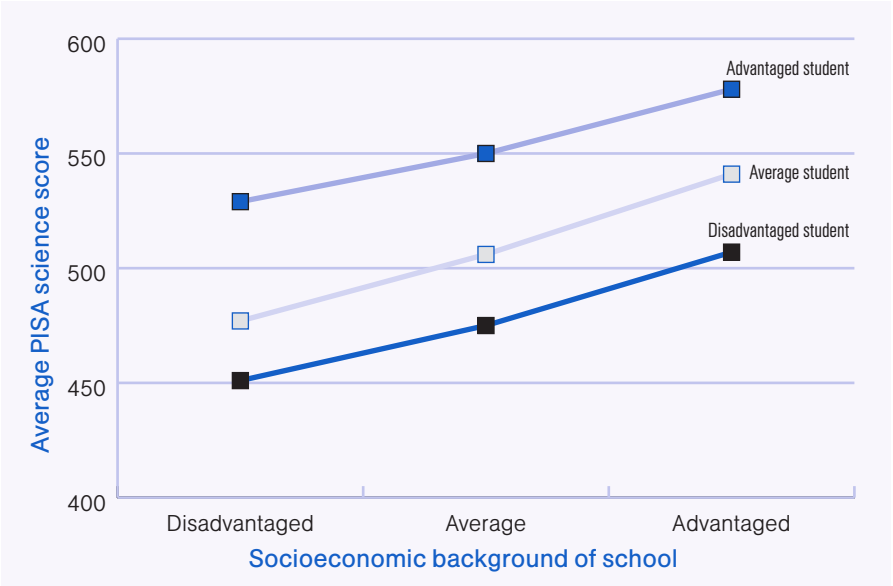

Figure 2. Relationship between student and school socioeconomic background and science achievement, Australia, PISA 2015

The message from this analysis of the PISA 2015 data for Australia seems clear and consistent. For Australian students both student- and school-level SES matter consistently and substantially in the academic performance of students in science. The disaggregation of the PISA 2015 data for Australia shows unequivocally that increasing student and school group SES are strongly associated with more positive academic outcomes.

Are there differences between disadvantaged students and advantaged students, and between those in advantaged and disadvantaged schools, on other outcomes of school, non-cognitive areas such as enjoyment of science, for example?

Students' level of enjoyment of learning science was derived from their level of agreement with the following five statements, measured on a four-point scale (strongly disagree; disagree; agree; strongly agree):

- I generally have fun when I am learning science topics
- I like reading about science topics
- I am happy working on science topics
- I enjoy acquiring new knowledge in science
- I am interested in learning about science.

The five items were standardised to create an index of enjoyment of learning science. Positive values on this index indicated higher levels of student enjoyment of science. Students in Australia had a mean index score of 0.12, which was significantly higher than the OECD average of 0.02. However, averages can mask big differences. Figure 3 shows the index of Enjoyment of science, by student and school socioeconomic background.

As in Figure 2, Figure 3 shows that there are substantial differences on this one measure between students in different schools. Disadvantaged students in disadvantaged schools have the lowest levels of enjoyment of science. Their average score was significantly lower than the OECD average, and significantly lower than that of advantaged students in similar disadvantaged schools. However, disadvantaged students in advantaged schools had a level of enjoyment of science that was not only significantly higher than the OECD average, but was not significantly different to that of the advantaged students within the same type of school. Interestingly for socioeconomically advantaged students, there was no significant difference between their score on this scale between those in disadvantaged schools and those in advantaged schools.

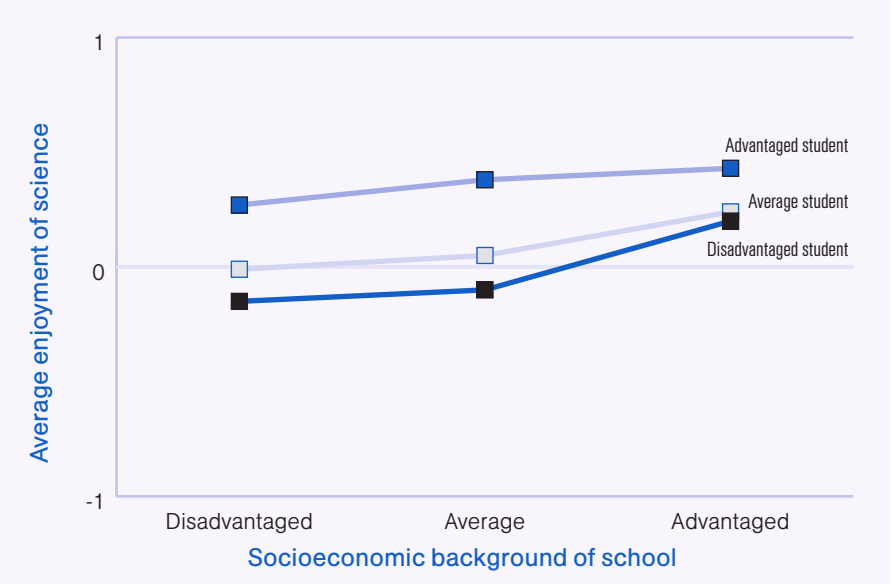

Figure 3. Relationship between student and school socioeconomic background and enjoyment of science, Australia, PISA 2015

School climate

From the previous analyses, it seems clear that schools matter. What is it about disadvantaged schools that make it difficult for students to learn? PISA can also provide some insights into this.

Student and teacher behaviour hindering learning

To examine the impact of student behaviour factors on school climate, principals were asked to report the extent to which the learning of students was hindered by a series of 10 items using a four-point scale (not at all; very little; to some extent; a lot). Using these items, two indices were constructed, the first was an index of student behaviour hindering learning and the second an index of teacher behaviour hindering learning.

The index of student behaviour hindering learning comprised the following five items:

- student truancy
- students skipping classes
- students lacking respect for teachers
- student use of alcohol or illegal drugs
- students intimidating or bullying other students.

Principals' responses to these questions were likely to reflect both how frequently these phenomena happen in their schools and, when they do occur, how much they affect student learning. Positive values on this index reflect principals' perceptions that student behaviour hinders learning to a greater extent, and negative values reflect principals' perceptions that student behaviour hinders learning to a lesser extent than, on average across the OECD. In Australia, there was a moderate negative relationship between student behaviour hindering learning and scientific literacy performance ($r = -0.28$). Higher scores on the index were reflected in lower scores on science achievement.

Figure 4 shows the proportion of students in disadvantaged and advantaged schools whose principals responded 'to some extent' or 'a lot' to each of the items.

It is evident from this figure that there are massive differences in the extent that principals perceive there to be student behavioural issues within disadvantaged schools that compromise student learning. Student truancy was reported by the principal as a problem for about 45 per cent of the students who attended disadvantaged schools, compared to just 3 per cent of those who attended advantaged schools. Similarly, students skipping classes is an issue for principals in about half of the disadvantaged schools, but in just

2 per cent of advantaged schools. The proportion of students lacking respect for teachers is also of concern, with this being identified as an issue in 43 per cent of disadvantaged schools but just 2 per cent of advantaged schools. The use of alcohol and drugs, and the amount of bullying at a school, were more prevalent than the other student behaviours at advantaged schools, but the differences were still substantial.

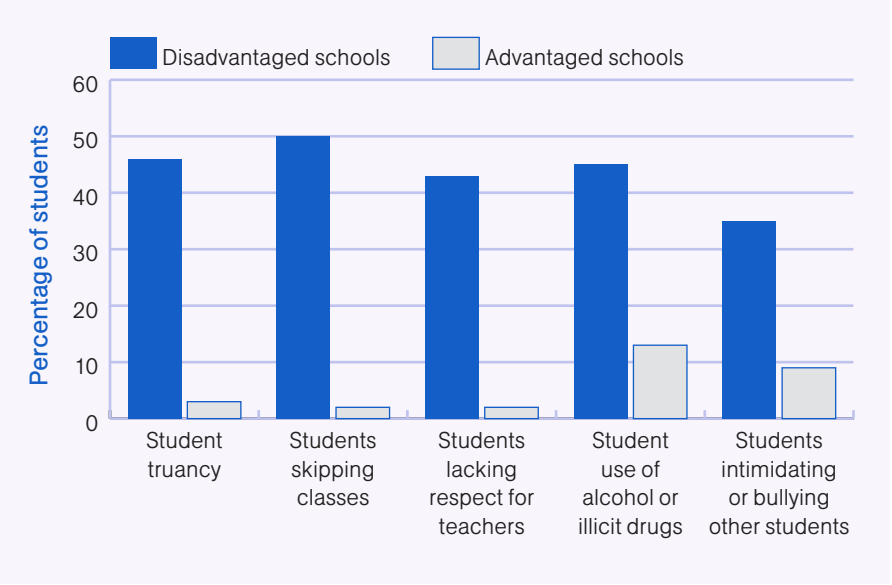

Figure 4. Student behaviours hindering learning

Teacher behaviour hindering learning

School principals were also asked to report the extent to which they believed that student learning in their schools was hindered by teacher behaviours. The index of teacher behaviour hindering learning was constructed with the following five items:

- teachers not meeting individual students' needs
- teacher absenteeism
- staff resisting change
- teachers being too strict with students
- teachers not being well prepared for classes.

Again, items comprising this index were standardised to have a mean of 0 and a standard deviation of 1, with positive values reflecting principals' perceptions that these teacher-

related behaviours hinder learning to a greater extent compared to the OECD average. In Australia, there was a weak negative relationship between teacher behaviour hindering learning and science performance ($r = -0.11$). Higher scores on the teacher-behaviour index were reflected in lower average science scores.

Figure 5 shows the proportion of principals in disadvantaged and advantaged schools who responded 'to some extent' or 'a lot' to each of the items.

The differences between advantaged and disadvantaged schools are not quite so stark on this scale, however on all but one, a higher proportion of principals report that the behaviour hinders learning 'to some extent' or 'a lot'.

The perception of teachers not meeting individual student needs is seen as an issue by about 25 per cent of principals at disadvantaged schools and 17 per cent of principals of advantaged schools. Staff resisting change is an interesting point of difference: in this case principals at advantaged schools see this as a problem to a greater extent than do principals at disadvantaged schools. Teacher absenteeism at disadvantaged schools is potentially a major issue. If teachers are frequently absent then continuity of teaching is compromised, particularly in subjects like mathematics and science. This makes it very difficult for students to learn, and more so if they are frequently absent as well.

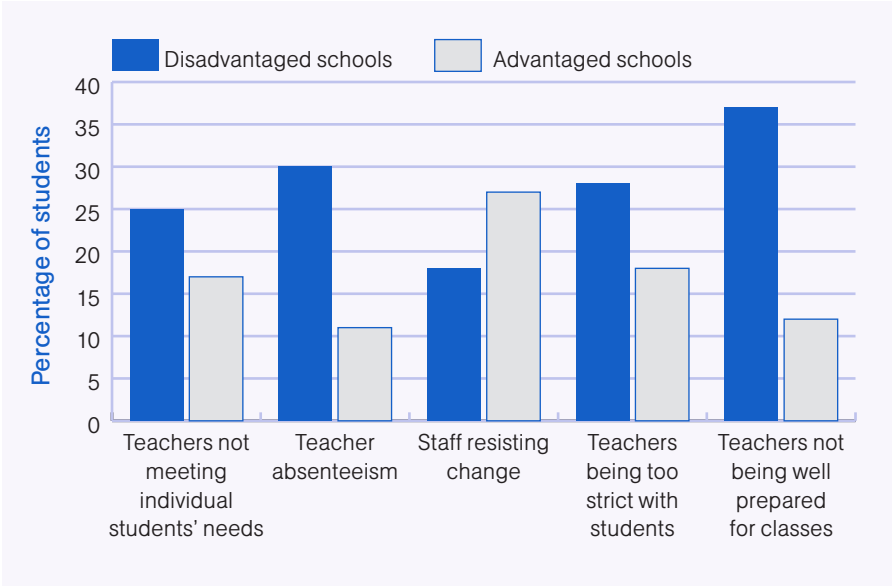

Figure 5. Teacher behaviours hindering learning

School resources

Shortage of teaching staff and assistants

Access to school resources was examined by asking principals to report whether their schools' capacity to provide instruction was hindered by a shortage of resources across eight items, with responses on a four-point scale (not at all; very little; to some extent; a lot). Using these items, two indices were constructed, the first an index of shortage of educational staff and the second an index of shortage of educational materials including physical infrastructure. The index of shortage of educational staff comprised the following four items:

- a lack of teaching staff
- inadequate or poorly qualified teaching staff
- a lack of assisting staff
- inadequate or poorly qualified assisting staff.

When interpreting these findings, it should be kept in mind that school principals did not provide an objective measure of the condition of educational resources, but rather they provided their *perceptions* of whether a shortage or inadequacy of educational resources hindered the capacity to provide lessons in their schools. Therefore caution is needed when comparing responses across countries and schools. In Australia, there was a moderate negative relationship between shortage of educational staff and scientific literacy performance ($r = -0.18$). A greater reported shortage of educational staff was reflected in lower levels of science performance.

Figure 6 provides the responses from principals on these items. On every item comprising this index, students who attended disadvantaged schools were more likely to have principals who reported that the statement was an issue compared to those from more advantaged schools.

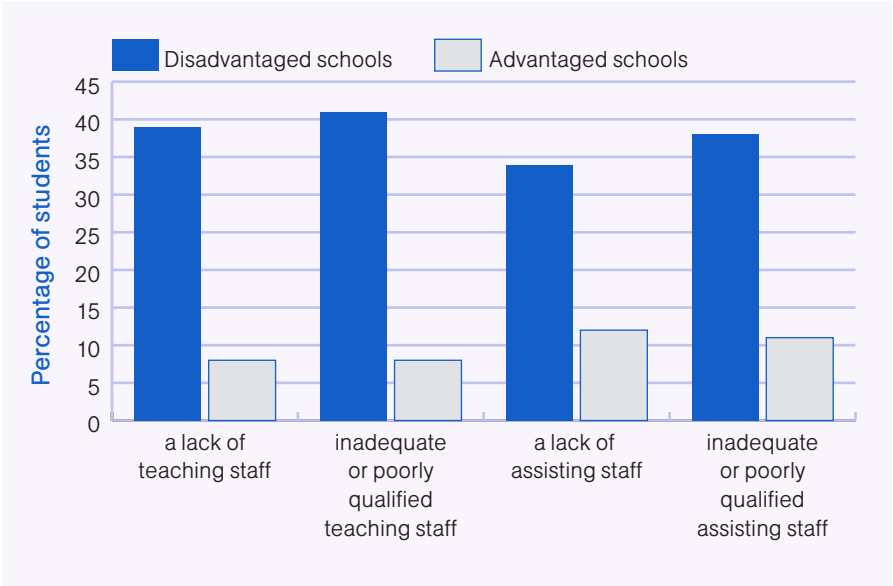

Figure 6. Shortage of staff

Shortage of educational materials including physical infrastructure

A further aspect of school resourcing specifically related to physical infrastructure and supply of educational resources was explored, as the absence of such resources could negatively affect student learning. The second index in this section, the index of shortage of educational material including physical infrastructure, was constructed using the following items:

- lack of educational material (e.g. textbooks, IT equipment, library or lab material)
- inadequate or poor quality educational material (e.g. textbooks, IT equipment)
- lack of physical infrastructure (building, grounds, heating/cooling, lighting)
- inadequate/poor quality physical infrastructure (building, grounds, heating/cooling).

Positive values on the index reflected principals' perceptions that the shortage of educational material hindered learning to a greater extent than the OECD average. In Australia, there was a weak negative relationship between a shortage of educational materials and science performance ($r = -0.14$). A greater reported shortage of educational materials including physical infrastructure was reflected in the lower levels of science performance.

Figure 7 shows the proportion of principals in disadvantaged and advantaged schools who responded 'to some extent' or 'a lot' to each of the items.

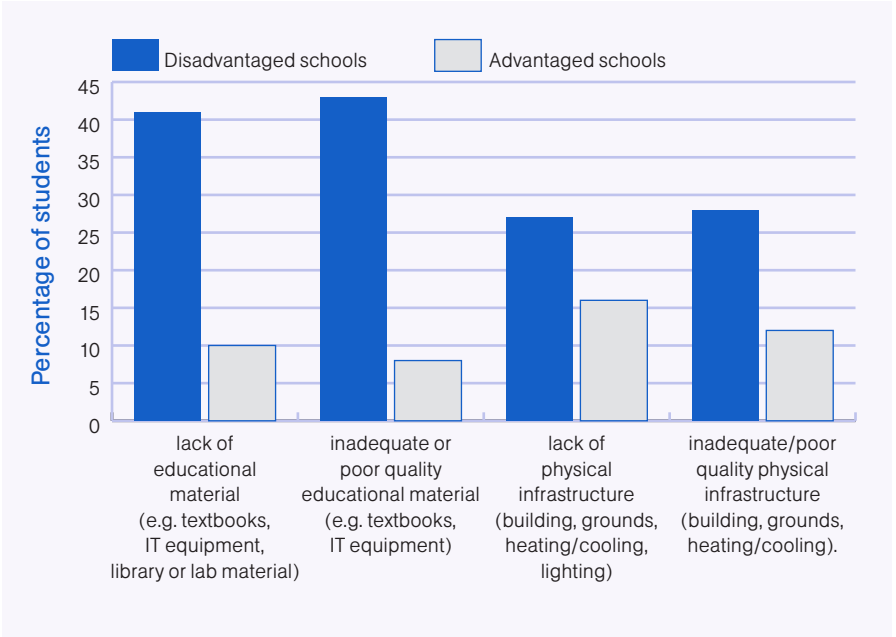

Figure 7. Shortage of materials and infrastructure

As may be expected, resources were a key issue for students in disadvantaged schools – the principals of 41per cent of these students reported that a lack of, or inadequate, educational material limited their capacity to provide instruction, while principals of 25 per cent of students in disadvantaged schools reported that poor quality or a complete lack of physical infrastructure hindered their capacity to provide instruction.

Conclusions

These findings show that where one goes to school in Australia makes a significant difference for students' science performance. This is inequitable because it means that a student's achievement is heavily influenced by his or her family's ability to afford a good school. If Australia is to turn around the decline in PISA scores, it has an opportunity to do so by lifting the performance of our lowest achieving students. To do so makes sense on more grounds than equity, or it being 'the right thing to do'. Economists have argued that

increasing Australia's average PISA score by 25 points, for example, would provide an increase of more than $3 million to its GDP (OECD, 2010, for example).

We need to ensure that education provides a level playing field for all students. While schools cannot compensate for a disadvantaged background, we can ensure that all schools have adequate resources – both physical and in terms of teaching staff to teach properly. Students cannot feel motivated to learn if they feel they are not valued by the system.

Notes

1 The school-level SES is calculated as the average SES of all PISA students attending the school. Using the data from all participating schools, quartiles were formed. The lowest quartile corresponds to 'low SES' or disadvantaged schools, the highest to 'high SES' or advantaged schools, the remaining middle quartiles were labelled as 'average'.

Aboriginal and Torres Strait Islander teachers in Australian schools

Peter S Johnson

The under-representation of Aboriginal and Torres Strait Islander people in the professions has been the subject of many discussions - and teaching is no exception.

At the 2011 census, it was estimated that 669,900 people or 3 per cent (ABS 2013) of the Australian population identified as Aboriginal or Torres Strait Islander. In the most recently published student enrolment figures 5.5 per cent (ABS 2016) of Australian school students identified as of Aboriginal or Torres Strait Islander descent.

How does this compare with the proportion of teachers in Australian schools who identify?

The National Aboriginal Education Committee commissioned research in 1979 into the representation of Aboriginal and Torres Strait Islander teachers in Australian schools. At the time, it was reported that 72 teachers across Australian schools identified. Hughes and Willmot (1982) projected through their research that there should have been 2,001 if proportional to the Australian population of the time.

One of those 72 teachers, Kerry Ella Fraser, reflects:

> *"Aunty Joyce Woodberry was one of the state's first Aboriginal Education workers. She was a great advocate for the need for more Aboriginal workers, and more importantly Aboriginal teachers, in schools. Her passion inspired me to want to teach and dedicate my years of service to Aboriginal Education in schools.*

Peter Johnson is a former Executive Director with the NSW Department of Education. He had responsibility for the Department's Human Resources function, including the recruitment of Aboriginal and Torres Strait Islander staff. Peter began his career as a primary teacher and also worked as a demographic planner and primary school principal. He was a member of NSW BOSTES and AITSL initial teacher education and quality teaching committees. In 2015/16 Peter chaired the evaluation of the More Aboriginal and Torres Strait Islander Teachers Initiative (MATSITI), furthering his commitment to the employment of Indigenous teachers in Australian schools.

> *There were enormous pressures, especially in my early years. The expectation was that Aboriginal Education in the schools in which I taught was not everyone's business, it was my business. I was expected to be the expert, and have all the answers. I had to organise all Aboriginal cultural activities, celebrations, home work centres, tuition groups - often with little support. There was no support network. I felt isolated."*

Numerous committees, working parties, conferences and governments (state, territory and federal), have flagged the need to increase the number of Aboriginal and Torres Strait Islander teachers since Hughes and Willmot set their target of 1,000 Aboriginal and Torres Strait Islander teachers by 1990.

The *National Aboriginal and Torres Strait Islander Education Policy* of the 1980s (DEET 1989) included a long-term goal "to increase the number of Aboriginal people employed as ... teachers ..." (DEET 1989 p14). This was recognition of the view that "Aboriginal people generally seek education that is more responsive to the diversity of Aboriginal circumstances and needs, and which recognises and values the cultural background of students" (DEET 1989 p9).

This was reaffirmed by the Ministerial Council on Education, Employment, Training and Youth Affairs in 2000 (MCEETYA 2000) and acknowledged in a report to the Commonwealth Parliament in 2001 (DEST 2001).

The parliamentary report of 2001 indicated that the number of teachers of Aboriginal and Torres Strait Islander descent had exceeded the target set by Hughes and Willmot, with 1,338 employed across Australian government schools and 52 across Catholic schools (DEST 2001 p31). This was still well below the proportion in the broader population.

The *Melbourne Declaration on Educational Goals for Young Australians* acknowledged that:

> *"Australian schooling needs to engage Indigenous students, their families and communities in all aspects of schooling; increase Indigenous participation in the education workforce at all levels; and support coordinated community service for students and their families that can increase constructive participation in schooling."* (MCEETYA 2008).

This was consistent with the broader agenda of the Council of Australian Governments and its emerging desire to Close the Gap (COAG 2008) on Aboriginal and Torres Strait Islander disadvantage across all aspects of life.

However, progress appeared to languish until 2011 when the then Minister for School Education, Early Childhood and Youth, Peter Garrett, funded the *More Aboriginal and Torres Strait Islander Teachers Initiative* (MATSITI). The project was established with four years of funding provided up front, and drew together an experienced team of Aboriginal and Torres Strait Islander educators under the leadership of Professor Peter Buckskin of the University of South Australia. Emeritus Professor Paul Hughes and Dr Kaye Price were integral to the project.

The brief of MATSITI was to coordinate a response to the issue across all Australian school education jurisdictions and universities to find "practical ways to encourage more Aboriginal (and Torres Strait Islander) people to pursue a career in teaching" (Garrett 2011). The initiative also recognised the critical role which Aboriginal and Torres Strait Islander people had to play in achieving MATSITI's aims.

A MATSITI commissioned study identified that there were 2,661 Aboriginal and Torres Strait Islander teachers in Australian schools in 2012, comprising 1.2 percent of the teacher population (MATSITI 2014). Allowing for the constraints of the data collection, this was projected to be 3,700 teachers or just under 1.7 percent, still well below the 4.9 percent of Aboriginal and Torres Strait Islander students estimated to be in Australian schools at the time.

A subsequent workforce collection in 2015 revealed a net increase of 439 teachers since 2012. Whether this can be attributed to MATSITI is arguable. There are certainly indications in the analysis of the data that MATSITI provided the impetus for more culturally sensitive workplaces where teachers are more likely to identify. There was also a significantly renewed focus on strategies to contribute to the MATSITI objectives.

It appeared that the education community had risen to the challenge; a challenge that predated the work of Hughes and Willmot; a challenge that will need to continue to be met to achieve parity between the proportion of Aboriginal and Torres Strait Islander teachers and students in Australian schools.

NSW Achievement

The successes of recent years have been varied across the school education jurisdictions. Without a doubt, New South Wales has led the way in implementing strategies to increase the number of Aboriginal and Torres Strait Islander teachers and build the capacity of those teachers to aspire to leadership positions.

In 2005 there were 283 teachers in New South Wales public schools who identified as Aboriginal or Torres Strait Islander. This equated to 0.6 percent of teachers in public schools. By 2015 this had increased to 1,110 teachers or 2.23 percent. The advice of the NSW Department of Education is that this has increased to around 1,280 teachers in mid 2017.

How has this been achieved?

Public education in New South Wales is the only school education jurisdiction in Australia which provides ultimate preference for the employment of Aboriginal and Torres Strait Islander teachers. This is embedded in the Teaching Service Act 1980, the act which overarches the employment of all teachers in New South Wales public schools.

Since 2008 each staffing agreement between the NSW Teachers Federation and the Department of Education has ensured that the employment of Aboriginal teachers, along with incentive transfer applicants, is considered first when filling vacant teaching positions.

This has been accompanied by the successful *Join Our Mob* (NSW DoE) promotional recruitment campaign and strategies including scholarships, mentoring and tailored career and leadership development programs.

The successes of New South Wales also hinged on the positive relationships developed between the Department of Education's human resources team, officers of the NSW Teachers Federation and the leadership of the NSW Aboriginal Education Consultative Group.

The Victorian Situation

The Victorian Department of Education and Training, in conjunction with the Victorian Aboriginal Education Association Incorporated (VAEAI) developed the *Marrung Aboriginal Education Plan 2016-2026*, its strategic approach to Aboriginal education.

While Marrung outlines strategies intended to support the development of Aboriginal students, there is no commitment to increasing the number or proportion of Aboriginal teachers in Victorian government schools.

Marrung commits to "working with the Victorian Institute of Teaching and providers of initial teacher education programs to strengthen the integration of Koorie culture across all

learning disciplines". There is, however, no mention as to what part local Koorie people may play as teachers. The only teaching or education related scholarships identified specifically for Aboriginal people by the Victorian government are in early childhood settings.

The Victorian Department was also notably absent in participating in the MATSITI project as a project partner. The 2015 MATSITI workforce collection revealed that the proportion of teachers in Victorian schools who identified as of Aboriginal or Torres Strait Islander descent was 0.1 per cent, compared with 1.5 per cent of students.

Victorian initial teacher education providers, through the Australian Council of Deans of Education, participated in a major MATSITI strategy to "build institutional and collective commitment and capacity within and across Australia's teacher education institutions to increase the number of Aboriginal and Torres Strait Islander teaching graduates from 2013 to 2020".

The relationships in universities between the faculty of teacher education and the Indigenous student services or education centres have been important in furthering this end. Professor Brenda Cherednichenko, Executive Dean of the Faculty of Arts and Education at Deakin University, said that at her university:

> *"The Institute of Koorie Education works closely with School of Education colleagues to continuously improve our approach to teacher education for Aboriginal teacher education students, provide appropriate initial teacher education curriculum and experience for all preservice teachers and also to provide specific programs in a community based model for Aboriginal and Torres Strait Islander people who wish to become teachers but who need to remain in their community."*

The case for parity

Why is parity between the proportion of Aboriginal and Torres Strait Islander teachers and students a desired objective?

A great strength of public schools is that they can be considered to be a microcosm of society, open to students from the breadth of ethnic, cultural and religious backgrounds. They also provide education to students across the diverse geography of Australia. It is therefore arguable that teachers and other staff in those schools should be similarly representative. While non-government schools tend to be much more narrowly focused, particularly in terms of religious background and their presence in rural and remote

communities, they should not be precluded from more closely reflecting the society beyond their school gate.

Aboriginal sportspeople have long been held up as role models for young Aboriginal and Torres Strait Islander people. They are often portrayed in the media and public life as successful and can readily command attention from all levels of society. Less readily portrayed by the media as aspirational role models are Aboriginal and Torres Strait Islander people across the professions, including those who have the greatest contact with young people, teachers. This is not due to any perceived lack of capacity to influence the futures of young Aboriginal and Torres Strait Islander people, but more likely a reflection of media attraction.

In addressing the issue of the school "*completion gap*" for Aboriginal and Torres Strait Islander youth, Helme and Lamb (2011) conclude that a "school culture and leadership that acknowledges and supports Indigenous students and families" and the "involvement of the Indigenous community in education planning and provision" are among the most important factors.

There is a wealth of literature to support the view that Aboriginal and Torres Strait Islander students benefit from being taught by teachers who are also of Aboriginal or Torres Strait Islander descent. Santoro, Reid, Crawford and Simpson (2011) while acknowledging that Indigenous people are not a culturally homogenous group, present a view that only teachers who have experienced life as an Indigenous child and learner can fully understand the cultural, social and cognitive needs of Indigenous students:

> *"Teachers who have grown up and completed their schooling as Indigenous learners have a wealth of experience and knowledge about the pedagogies that are likely to be successful for Indigenous students".*

Kerry Ella Fraser recalled:

> *"It was always a proud moment when ex-students said it was due to my influence that they chose Aboriginal Studies in high school to learn more about Aboriginal people, culture and history.*
>
> *My advice to young Aboriginal people thinking of teaching is to find out what the job is like - visit classrooms, volunteer and experience what really happens in a classroom. Watch how teachers interact with students and witness those many hats a teacher wears."*

The MATSITI project (2011-16) was a significant catalyst in increasing the number of Aboriginal and Torres Strait Islander people entering and remaining in professional teaching positions in Australian schools. Governments, teacher educators and school education jurisdictions now need to take up the running.

Ongoing success will only be achieved: when there is parity between the proportion of Aboriginal and Torres Strait Islander teachers and students across all school education jurisdictions; when targets are no longer needed; and when the training, recruitment and development of Aboriginal and Torres Strait Islander teachers and school leaders is viewed as a mainstream outcome.

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Neurodevelopmental differentiation

Optimising brain systems to maximise learning

Andrew Fuller and Vicki Hartley

Teachers know that the composition of any class of students is as diverse from year to year as the range of plants in our world. However, like plants, our classes always have distinctive similarities.

There are always students who would be placed at the extremes of various spectra indicating how much they enjoy coming to school and how often they actually attend, their favoured subjects, how likely they are to be found enjoying a book or climbing a tree in the out-of-bounds area of the playground.

In our experience, though, every classroom has a student, or sometimes two (who seem to be joined at the hip), who take on the self-appointed role of class police officer. Similarly, every year we seem to be confounded by a few students who, despite seeming to have all the right combinations of enthusiasm, intellect and work ethic, just don't make the expected rates of progress in one or more areas of their education. There are also the students who successfully demonstrate the learning from your lesson, only to arrive at school the next day with absolutely no idea of the concept. Then there are those who, regardless of how hard they try, just can't avoid bumping into their classmate's carefully constructed artwork, causing irreparable damage and an accompanying degree of frustration that once again, Hannah/Omar/Alex/Li-Pang has *ruined everything*.

When we encounter these students each year we remind ourselves, as all good teachers do, that students progress at different rates, learn in different ways and come to school with a wide range of life experiences and strengths. So we try another approach. We remind

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Hannah/Omar/Alex/Li-Pang about moving carefully in the classroom and respecting personal space, we revise the work with the student individually, we teach it in three other ways, we adjust the requirements of the task, we make links with other learning, we use relevant digital tools, create visual reminders and stick them to desks, the walls and sometimes to the students themselves. And in the afternoons we stare at the inspirational quotes that adorn our desks, reminding us that *No two flowers bloom in exactly the same way* and struggle with the fact that there must be *something* going on (or not) for these students, but we just don't know what it is or how to help. At these times it is important to remember that when a flower doesn't bloom, we first look to fixing the environment in which it grows, not the flower.

Education is about the development of individual minds. Effective teachers help each of their students' minds achieve their potential.

Traditionally we have thought about differentiation as the way teachers individualise the content (what is being taught), the process (how it is taught) and the product (how students demonstrate their learning) to meet the needs of individual students (Tomlinson, 2017). However, processes that develop naturally for some children have to be taught explicitly to others.

Neurodevelopmental differentiation (NDD) involves parents and teachers helping students to increase the effectiveness of each of their brain system areas and finding ways to have students succeed by compensating for areas that are taking longer to develop. This may require teachers making small but significant changes to their teaching practice. For example, using flexible groupings or giving visual prompts to students who struggle to follow verbal instructions. It also involves teaching students about their brains and how they learn so they can use their strengths to overcome obstacles to learning. Catering for these differences is what we call "neurodevelopmental differentiation" (NDD). This article aims to provide a brief overview to the approach.

The Brain Systems

Our brains consist of interlinked systems. As we develop and mature our brain systems function more efficiently within themselves and communicate with other areas more quickly. For all of us, there are times when these systems can be over or under-activated and we see the results in our learning and in our actions. The contributing factors for under or over activation include genetics, trauma, maturity, depression and anxiety, sleep deprivation and poor food intake. Additionally, some people have established patterns for either good or poor functioning in these areas.

The main brain systems include:

1. Concentration and Memory
2. Language and Words
3. Numbers
4. Spatial Reasoning
5. Perceptual/ Motor Co-ordination
6. Thinking and Logic
7. Planning and Sequencing
8. People Skills

Neurodevelopmental differentiation involves teachers:

- understanding the role of each of the systems in student learning,
- acknowledging that all students may experience challenges with one or more of the systems,
- understanding that brains develop individually and what may be tricky at age 5 may be age appropriate, but if the same problem is present at age 10 it may be significant,
- considering the current level of functioning,
- giving students opportunities to develop their skill level in brain systems and tracking their progress,
- determining the next priority areas for development.

The profile of brain systems can be integrated into a Learning and Skills Strengths Inventory (LASSI) for each student

Developing Brain Systems to Build Learning

In all of these brain systems, teachers can impact on:

- Inputs
- Processing
- Outputs

Inputs

As soon as information enters a child's brain, signals are sent to various relevant brain systems. Inputs include sensory awareness and integration, concentration, pattern detection, listening skills and perceptual awareness. Some students are overly vigilant to any disruption from the norm. Others can be so "teflon coated" and dulled or distracted that

a new idea would need to shout loudly to get noticed. Refining our radar and prioritizing inputs is an essential skill for effective learning.

Processing

Processing sorts out all of the sensory inputs (sights, sounds, smells) and connects them to usable thoughts and actions. They are like a router taking different inputs from the internet and directing them towards different computers in a house. Processing includes recognition, comprehension, understanding, noticing similarities and differences, rationalization, meta-cognition, thinking, decision-making and planning.

Some of us have brains that are wired to handle a lot of information at once, others have brains that can absorb and process only a little information at a time (often with greater accuracy). Some students have brains that process at lightning speed while others amble and meander about before developing answers. Interestingly, many notable and creative thinkers were described when they were at school as a bit "slow". School often rewards faster processing. There is value in learning how to process quickly and there is also value in processing slowly.

Outputs

Outputs are what we do as a result of the inputs and the processing. Output controls are responsible for behaviour, impulse control, previewing, planning, spoken and written expression, report writing, self-monitoring, and the completion of tasks. Some students are impulsive and rush into action and outputs before thinking things through. Others dawdle and procrastinate or become disorganised and have trouble monitoring their own progress. When outputs are efficient, we can conserve mental energy.

Summary of the Major Brain System Areas

1. Concentration and Memory

When concentration and memory systems work well, we can be productive and learn to behave appropriately. Dysfunctions of concentration create mayhem in the learning process and also in family life. Concentration and memory require alertness, orientation to sensory events, processing of incoming information and regulation of output and behaviour. Concentration can be thought of as the gear shifter of the human brain – it allows us to focus and to shift our focus and our actions according to different demands

and contexts. Some aspects of concentration may function well and other aspects may not function optimally. The concentration system is particularly susceptible to distractions, stress and disturbances. Even people with very good concentration may have difficulty processing auditory sounds in a noisy environment.

The strongest correlate of school success is intelligence and the strongest correlate of intelligence is memory. Memory is particularly important for learning to read. This is why the development of memory is a skill worth developing.

2. Language and words

Language is central to thinking. We build our language from sounds to fragments of words, to entire words, to whole sentences, to lengthy chains of sentences, and finally to the process of not just thinking in language but thinking about language.

Language links with sequencing. When we tell a story the sequence of our ideas is critical. Language also relates to spatial ordering and visual processing. Being able to visually imagine a story dramatically enriches language experiences. Language also plays a significant role in motor function. During the early stages of building any skill, we are likely to think aloud through the steps involved.

Language Inputs

There are three main phases of learning to read.

1. Pictorial stage – children "photograph" a few words and treat words like pictures. Both hemispheres of the brain are involved. Infants extract, sort and classify segments of speech. The best predictors of early success in reading are letter knowledge and phonemic awareness involving the development of the alphabetic principle.

2. Phonological stage – children learn to decode graphemes (letters or groups of letters) into phonemes (sounds). Activation becomes more focused and slowly converges on the ventro-occipital temporal region. Phonological awareness involves speech being segmented into sounds, for example 'cat' rhymes with 'hat', the first letter of snake is 'ssss'.

3. Orthographic stage – word recognition becomes fast and automatic. Several brain circuits are altered during this process, especially the left ventro-occipital temporal region. The conversion of letters into sounds is the key stage in reading acquisition.

Language Processing

In order to move beyond the pictorial stage a child must learn to decode words into component letters and link them to speech sounds. Children who are most fluent in phonological games such as rhyming learn to read more quickly. Practice with speech sound manipulations at an early age improves both phonemic awareness and reading scores. Vocabulary knowledge involves the recognition of words when they are read and memory capacity. This enables whole-word recognition and the ability to derive meaning from written text.

The goal of reading instruction is to lay down an efficient neuronal hierarchy so that children can recognise letters and graphemes and easily turn them into speech sounds. All other aspects of literacy – spelling, vocabulary, nuances of meaning – depend on this step.

Language Outputs

Some students have difficulty writing, even though they have lots to say. Others can be inarticulate but write fluently.

3. Numbers

Inputs

The intra-parietal sulcus activates whenever we think of a number. Children with dyscalculia often have impairments or delayed development of the intra-parietal sulcus. This part of the brain is also involved in movement, rhythm and music

Processing

Children first learn to count and then to add and subtract small numbers. Next, they learn about place value and working with larger numbers before moving on to multiplication and division. All of this early learning relates to whole numbers. Then students learn about fractions, decimals and percentages. This is known as the *number sense* from which mathematics develops. Number sense skills include: rapidly identifying small numbers, recognising how numbers can be ordered, reasoning about simple transformations (e.g. adding and subtracting), and applying counting to solve number problems.

Outputs

Maths is about patterns and cause and effect chains of reasoning. It is important to encourage students to disclose their own understanding of what they have learned and to show connections between the concepts they have learned. Student explanations of their thinking and reasoning should be included as a part of many lessons.

4. Spatial Reasoning

“How many animals are hidden in this picture?” “Which of these shapes has a right angle in it?” “Touch your right shoulder with your left hand.” “Find the route on a map from home to school.” All these demands trigger our perceptions of objects in space. There is a strong overlap between spatial reasoning and mathematical thinking.

Inputs

Children with poor spatial reasoning often are seen by others as clumsy. They often stand too close or too far away from the people or objects that they are interacting with. These children often find it hard to tell their left from right and they confuse positional language i.e. over, under, in or out, left or right. This makes it hard for them to follow directions that use such language.

Processing

In the classroom the child with spatial reasoning difficulties often finds mathematics hard. This is due to the abstract concepts of the subject especially where shapes, areas, volume and space is involved. They will have problems reproducing patterns, sequences and shapes. Their strengths, however, are with the more practical and concrete subjects.

Outputs

These students often excel at using a multisensory way of learning. They often have good auditory memory skills and have strength in speaking and listen well. They tend to have good verbal comprehension skills and their strength is usually in verbal and non-verbal reasoning. Art teachers, PE teachers and music teachers are among the most perceptive observers of neuro-developmental function in any school setting. The development of fine and gross motor skills also relate to grapho-motor functioning and our ability to write.

5. Perceptual/ Motor Co-ordination

Inputs

These neuro-motor functions make possible cursive writing, playing the fiddle, and guiding scissors. Motor coordination is important to children; being able to show off proficiency makes an important contribution to self-concept and confidence

Processing

The sequencing of body movements is helpful in dance, sport, art and in relating to other people.

Outputs

Perceptual issues may result in misinterpretation of others' intentions and inappropriate behaviours.

6. Thinking and Logic

Higher-order thinking includes the ability to problem solve and reason logically, to form and make use of concepts (such as mass in physics), to understand how and when rules apply, and to get the point of a complicated idea. Higher-order thinking also takes in critical and creative thinking. Higher-order thinking involves decision making, reasoning, critical thinking, creative thinking and seeing the linkages between ideas and concepts.

Inputs

The consideration and evaluation of different perspectives and sources of information is essential for thinking clearly.

Processing

Higher-order cognition is essential for clear understanding of the many concepts and processes that students must conquer for success at school. Examples include using logic to solve problems, making complex decisions, expressing ideas in writing or with other media, using evidence to justify their own opinions or challenging the opinions of others.

Outputs

The opposite of impulsivity is good problem-solving skills. Higher-order cognition requires deep understanding, not just memorization and re-gurgitation. There is obviously an optimal speed range for anything that we do. Pacing can also be set at too slow a rate. Some kids with output control problems grind everything out too slowly. Some actually move around at a snail-like rate.

7. Planning and Sequencing

Planning and sequencing are essential in maths, in completing science experiments or arts projects, in playing music, understanding the plot of a story, time management and connecting new ideas to what we already know. Teachers can assume that these connections are being made. Often they are not, and we need to explicitly teach students how to do it consciously.

Inputs

Planning and sequencing inputs create learning by enabling ideas to stick together. If there is no planning and sequencing nothing binds to anything else, new information rings no bells whatsoever.

Processing

Students have to practise asking themselves, "What does this fit with? What does this change my mind about? What does this new stuff remind me of? What should I do next?" We need to help them develop a plan for doing one thing at a time. All children need help to do things in steps rather than all at once. Students need well-thought-out work plans to facilitate this process.

Outputs

Previewing, consideration, weighing up options, and adjusting pace, all help students become more considered and reflective. If you add together weak previewing plus the absence of options (i.e. doing the first thing that comes to mind), plus frantic pacing, you come up with the well-known trait called impulsivity. Students with output control problems tend to be oblivious of, or insensitive to, feedback.

8. People Skills

A child (or adult) may be strong in the seven other neuro-developmental systems yet seem to fail in life because he or she is unable to behave in a way that fits appropriately with others of their age group. They may have trouble establishing new friendships and keeping old ones or working collaboratively in groups. Even the most brilliant child can end up frustrated if he is too shy, socially inept, or antisocial.

Inputs

Knowing your own emotions and being able to read the emotions of others is the determinant of happiness and success. Friends and peers play a dominant role in shaping the brains of their friends. Being curious about how other people think and see things is a powerful motivator of learning

Processing

Being able to develop empathy – the ability to see things from another's perspective – enlarges our world. Knowing how to regulate our own emotions and eventually how to help other people regulate theirs is an essential predictor of resilience and life success.

Outputs

Developing compassion – the willingness to help others who are upset – is kind and also empowering and enabling. Being able to take steps to calm our own responses is a useful life and relationship skill.

Summary

We are entering an exciting new time in education – a time when we can utilise the research on brain systems and combine it with research on learning, to help our students develop their brain systems to meet their potential. The use of neuro-developmental differentiation provides a way for teachers to cater for and build different strengths for different types of students.

In the space of one article we have been able to introduce you to this concept but have not been able to outline the strategies to accomplish these gains. These are best developed with teachers in collaborative workshops. You can arrange these by contacting Andrew Fuller or Vicki Hartley at **www.andrewfuller.com.au**

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The Shepparton Neighbourhood Schools Project:
addressing the needs of children who have experienced environmental trauma

Peter Eastaugh, Kerri-Anne Souter, Jenny Manuel, Marian Wetherbee, Peta Van Popering & Donna Berry

The Shepparton Neighbourhood Schools is a collective of three schools which service some of the most disadvantaged communities/children in the Shepparton region. The schools work together to provide a coordinated approach to educational and ancillary services to address the specific needs of their school communities. In 2011, the Neighbourhood Schools, and two Mooroopna schools also servicing a largely disadvantaged community, formed a partnership with a paediatrician, Dr Peter Eastaugh, to provide paediatric services to students from vulnerable families.

At that time there were in excess of 200 children from schools in the Shepparton district who were on a waiting list for developmental or behavioural paediatric assessment. Approximately 50 per cent of these children attended the Neighbourhood Schools. Several reasons existed for such an extensive waiting list, not the least being the escalating numbers of children in all schools who were experiencing substantial developmental learning and behavioural problems. These problems were having a major effect on the capacity of schools to engage such students in their education, and their behaviour also had a wider impact on other children.

Teachers felt very under resourced, untrained and unsupported and there was no satisfactory structure available to schools to provide a coordinated management process for these children. Since the 1980s school support services had been progressively

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diminished with many of these services supposedly outsourced, but with insufficient funding to go anywhere near addressing the high needs and increasing complexities of the children.

Despite international literature to the contrary, the area Paediatric Mental Health Services considered that these children had behavioural problems and did not have a mental health problem. The attitude of Mental Health Services has changed somewhat following a recent review, but they are unable to meet the complex therapeutic needs of this growing cohort of disadvantaged children in primary schools. The escalation in numbers should also be considered against a background of increasing disadvantage in the community, the changing developmental environment which children are presently experiencing, and exposure of children to circumstances that have a major impact on their neurological development.

From a paediatric assessment perspective, the additional barriers were: the very high poor attendance rates at prearranged appointments, the lack of appropriately trained paediatricians to undertake the assessments, and the fact that these assessments are often considered by paediatricians to be onerous because of the complexity of the children's problems and the time commitment and follow-up commitment that is required. It is also very frustrating for the paediatricians who undertake the assessments to have limited therapeutic support services and/or processes to refer children to following assessments.

After almost 40 years in paediatric practice, the paediatrician (Dr Peter Eastaugh) expressed concerns that despite investment in many parent support services, the number of children requiring support continued to escalate. This raised doubts about the sufficiency of parental support and parenting programs to alter the intergenerational trajectory that would seem to have become inevitable. Recent (past 20 years) escalating knowledge concerning the neurological impact of environmental trauma and the need for therapeutic intervention has been supported by a large body of medical researchers (Tronick, Siegel, Perry), neuropsychologists (Schore, Hughes, Baylin, Carter, Seligman, Teicher) and behavioural therapists.

Child Centred Play Therapy

Following discussions amongst the partnership, the concept of a project based on therapeutic play was developed. Non-directive Child Centred Play Therapy (Therapeutic Play) is a developmentally appropriate counselling approach for children from the age of two years. The purpose of the play-based therapeutic intervention is an endeavour

to repair the neurological impairments that have resulted from early childhood trauma. Child Centred Play Therapy (CCPT) was originally created by Virginia Axline and has been practised for over 80 years. Its methodology, tenets and principles distinguish it from other play therapy approaches.

Through their language of play, children can use toys and materials to express themselves within the context of a safe therapeutic relationship. CCPT must be followed in its totality and is not a set of techniques or principles that can be employed at the discretion of the therapist. This method permits a focus on the child, most particularly his or her inner self, maintaining the assumption that play therapy can be most effective when the therapist does not direct but allows the child to take responsibility for the direction of the play therapy agenda. In CCPT children work through life experiences (past or present, conscious or unconscious), traumas and anxieties using symbolic and metaphoric means. Play allows children to re-enact frightening real life events through the use of toys and does not rely on verbal communication, as this narrative is often inaccessible to the child on a verbal level. The re-enactment is important because it provides a way for children to control in fantasy what is unmanageable in reality.

By participating in play and the safety of the therapeutic relationship, children can begin to make sense of their experiences and are free to transform an event and change their role from one of passivity into a role of active investigator or controller. Children who experience this gain an increased understanding of self, their world and past experiences, which nourishes the development of new neural connections within the child's brain. As a consequence, children develop an understanding of self, gain psychological insight and develop social, emotional, relational, and problem-solving skills and strategies – all of which leads to healing, self-discovery and growth.

The Neighbourhood Schools Paediatric Services Project has agreed that child centred play based therapy should be delivered through trained and accredited Play Therapists. The training program for Child Centered Play Therapy is provided by Play Therapy Australia which offers clinical training to mental health professionals. The course is delivered over a one year period and is presented in intensive modules with 50 hours of online learning in between each module to assist with immersion into the modality. The Australian Play Therapists Association (APTA) is Australia's peak professional body offering professional registration for play therapists. As part of this project all therapists, and the clinical psychologist who supervises the therapists, will be registered with APTA where standards require members to have completed sufficient clinical practice hours under clinical supervision alongside personal therapy.

The Project Process

- The classroom teacher identifies a child with significant developmental, learning and /or behavioural challenges or a child who has experienced significant environmental trauma.
- The classroom teacher consults through the school process and a decision is made by the school leadership team whether a paediatric assessment is required.
- The principal/assistant principal prioritises the child/family according to their school referral process or waiting list.
- The school wellbeing and engagement team facilitates the process of parents attending their general practitioner to obtain a referral to a paediatrician.
- Paediatric consultation is undertaken in the school environment. It involves a one hour consultation with parents and their child and a senior school administrator. Interpreters or indigenous liaison staff are provided by the school if required. The parents are encouraged to present with family members or advocates for additional support.
- Following paediatric consultation, all materials related to the child are assessed and a comprehensive report is prepared. A copy of this report is sent to the parents, the school and the referring general practitioner.
- At the next school clinic (generally in three weeks), the school arranges for the attendance of all professionals involved in the individual child's life including: the classroom teacher, allied health, social work, child protection or any other professional organisation that the parents feel would contribute to the case management discussion.
- After the case management discussion has been undertaken, the paediatrician produces a case management plan and timelines for interventions and support strategies at a classroom level.
- A minimum of two case plan management meetings per year are undertaken. These may occur more frequently if significant problems are identified.
- Using the general practitioner referral, all consultations and case conferences are bulk billed through Medicare.
- Existing parent support and additional parent support - Family Care, Families First, Child Protection, Aboriginal Family Service, other NGO support services and services provided through the Education Department (SSSO) support services program - continue.

Research Study

An essential part of the project is an ongoing research study to provide evidence that the project, and the theory behind the project, is a valid means of addressing developmental and behavioural problems in children, and is therefore worth incorporating into mainstream education. Participants in the project believe that schools can no longer be institutions that provide only learning and social development, but must also offer some therapeutic interventions.

This research involves using the Achenbach Child Behaviour Checklist to monitor the child's progress. It is undertaken at the initial consultation and is repeated 6 to 12 months into the program, and in subsequent further assessment as required. The Checklist is a multifactorial assessment tool that has been extensively used and validated to measure developmental behaviour and mental health in children.

Over the years 2013-2016 data has been collected on 300 children. The data includes demographic data, up to four episodes of Achenbach and both parent and teacher responses. The students involved were from three Shepparton primary schools – St Georges Rd, Wilmot Rd and Gowrie St. Mooroopna students did not enter the program until 2017. The gender break-up of students was: 93 female and 203 male. Students were from a range of cultural backgrounds including: 67 Indigenous, 41Iraqui, 18 Afghan, 7 Samoan and 7 African.

The diagnosis results identified a range of learning and behavioural problems in the children who were assessed: Learning difficulties (13.7%), Behavioural difficulties/ autistic (10.5%), Environmental trauma (25.0%), ADHD (6.5%), Physical disorder (8.2%), Psychosocial (8.6%), Oppositional Defiant Disorder (2.7%), Mental health (6.6%), Speech disorder (5.5%), Foetal Alcohol Syndrome disorder (5.7%), Low Intelligence (2.3%), Intellectual disability (3.5%), Conduct disorder (0.9%), Addiction (0.3%).

At least 60 per cent (170) of the children who have been assessed have been diagnosed with developmental or behavioural problems attributed to complex environmental early childhood trauma. A small number of children (8 per year) have received therapeutic play.

Significant support has been received from the Sir Andrew and Lady Fairley Foundation which contributed $30,000 to train three therapeutic play specialists. This training was arranged through the Australasian Play Therapy Association (APTA). The three

Neighbourhood Schools, joined by the two Mooroopna Primary Schools, have used recent State Government Equity Funding to employ one fully trained and three in-training therapeutic play specialists to join the project and to provide intervention for children identified through the paediatric assessment process as having been exposed to environmental trauma. These play specialists are completing Play Therapy Australia's clinical program and are working towards Clinical Membership with APTA. The specialist clinical program consists of both theoretical and experiential components. As part of the program all four therapeutic play specialists will work under the supervision of an experienced clinician.

Data collection will continue and additional data will be collected using a therapeutic play assessment tool - Child Initiated Pretend Play Assessment. Negotiations have commenced with a major university to obtain a PhD student to use existing data and to analyse future data as a method of project evaluation. The Fairley Foundation has continued to advocate on behalf of the project and philanthropic funding will fund the evaluation project.

Anecdotally, the three schools report improved school engagement from children involved in the program, improved parent/ family engagement and increased teacher empathy, knowledge, skill base and use of relevant strategies to support diverse student learning and behavioural needs. All the professionals involved in this project believe that the model is essential for long term community well-being.

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Interview: Michael Fullan

Public school improvement and the role of school leadership in that process

John Graham

JG *A big question to begin with, and one which is increasingly critical to public education systems across Australia (where public schools have 65% of school enrolments): What do you see as the role of public schools in a democracy?*

MF Funny you should ask. South Australia has just had a Public Education Advisory Committee (2017) headed by Professor Alan Reid. Their report examined the past 150 years and concluded that the education system is based on three principles: compulsory, universal and secular; and six underpinning values: quality, equity, diversity and cohesion, community, democracy, collaboration and trust.

I agree, and would add that a strong public education system must serve the needs of all students, prepare students for life in the 21st century, and be a bedrock of societal cohesion. I know there has been a long debate about Australia's three- part system: government schools, Catholic and independent schools. If these systems do not work together the public good will be undermined.

What we are working on these days is equity and excellence as feeding on each other for the good of all. My advice is keep the spotlight on overall performance and how the three systems fare, work together, and otherwise develop. The performance of government schools is key in this equation.

JG *Collaboration between schools has an important place in furthering school improvement. However, one of the dilemmas which schools face when they work together to develop a collaborative district approach is that the financing of schools*

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is based on a competitive model linked to enrolments. School enrolments are influenced by the right of parents to enrol their children in any public school where there is additional capacity. This tends to develop a hierarchy of schools with a concentration of socially and academically disadvantaged students in some schools. This in turn places real pressure on collaboration. What needs to be done to address this fundamental tension in order to deliver the benefits of collaboration to all schools?

MF This issue has been a perennial problem in many countries. There are several elements of collaboration and action that I have been engaged in that leads to success. I list them here:

1. As Andy Hargreaves and I have recently argued, 'collaboration and autonomy' are not mutually exclusive. In fact if you stay only autonomous you will not grow. You are better autonomously if you connect, and a better connector if you have a degree of autonomy. See our *Professional Capital* book, and our report: *Bringing the Profession Back In*.

2. The overall system has to value and incentivize collaboration—intra school, interschool/network, inter-sector.

3. In all of our experience every time we set up collaborative networks and build transparency and trust, people's **experience** is positive. There are not actual problems of competition. Andy's finding in the book *Uplifting Leadership* is that strong organizations 'collaborate to compete'. The better that people are, the more they are inclined to collaborate and benefit from it. So I would say stop whining and get on with it, tolerate or otherwise deal with the odd rogue (getting better at a bad game), and identify and celebrate the advantages. Several of us have written about examples of positive collaboration, not to mention the disadvantages of staying isolated - Andy, David Hopkins, Alma Harris, Louise Stoll, Steve Munby, Lawrence Ingvarson, and so on. Incidentally, unions and the profession can and should help lead these developments.

JG You have written about the centrality of "moral purpose" to the principal's role. What are the implications of this for the principal of a public school? How should it be enacted in practice?

The AEU conducted a very large workload survey (13,000 responses) of teachers and principals this year. What clearly emerged from principal respondents was the small proportion of their time (average <20%) they were able to spend on educational

leadership. The majority of their time is taken up managing school administration, compliance and accountability requirements.

MF Yes, moral purpose is central to our work, and we have recently put it into dynamic perspective in our coherence framework book. The four components of the framework are: focusing direction, collaborative cultures, deep learning, and securing accountability (*Coherence: The Right Drivers in Action for Schools, Districts and Systems*, Fullan and Quinn, 2016, Corwin). And yes, I understand the constraints. I would start with the principal herself/ himself. There are many, many principals currently who find time to lead change. It helps if the system places a priority on it. Further, it is a hell of a lot more satisfying and personally healthy to run a collaborative organization while looking for efficient ways to deal with bureaucracy, and to 'manage' compliance and accountability.

It is not the school leader's job to implement government policy in a literal sense, but rather to exploit it relative to local priorities. Remember Viviane Robinson's major finding: school principals who have the greatest impact on student learning are those who 'participate as learners' with teachers to move the school forward. My book, *The Principal* (Jossey-Bass/Wiley, 2014) spells this out.

JG Principals indicated in our survey that they would like to change the situation they are in so that they can focus on leading teaching and learning improvement in their school. Do you have any ideas about how this can be done?

MF Yes, the book I just mentioned lays this out under 'three keys for maximizing impact': lead learner, system player, and change leader. Also their job description needs to highlight 'lead learner'. Principals need to start 'participating as a learner' with teachers and they need to work on changing instructional practice linked to measurable outcomes. This is highly specific (not to say prescriptive) work.

JG You have described principals as the "lead learner" in schools. Can you explain what you mean by this?

MF Lead learner is three related things: participate as a learner in working with teachers to move the school forward together; lead and learn in equal measure (you can't lead if you are not learning); and spend your tenure in any school (say for five or six years) developing a collaborative culture to the point where you become dispensable! You don't do the school much good over time if it can't carry on after your departure.

JG *What is the nature of the principal's role in instructional leadership (eg the parameters - where does it begin/where does it end)?*

MF It begins by focusing on instruction as a learner, not as the boss. The more you learn the more influential you become. Your job is to influence the instructional practice of teachers through teachers. It involves trust, non-judgmentalism, transparency, specificity and measurable learning outcomes.

JG *The school improvement relationship between the system, the school and the role of school leaders is complex and constantly under review by one of more of these components.*

MF More and more we are involved in system work. It is a long story so I am going to have to be cryptic. Generally it involves more purposeful action vertically and laterally—up and down and across all levels. Our short version of this is: the top frames; the middle (networks or districts) strengthens, and the bottom (individual schools) gets liberated. Exploit upward, liberate downward would be the tweet. Another aspect of this is 'to go outside to get better inside'. Such a system is more dynamic, and more democratic.

JG *What is the link between school improvement and system improvement?*

MF My response to the previous question captures this. Schools *are* the system. Improvement must be a joint enterprise: collaboration and autonomy. We are actually working with the California system (from governor to school and vice versa) on this very model where they have combined system direction and local autonomy. Our report will be on my website in late August: Fullan & Rincon-Gallardo: *California's Golden Opportunity: Leadership from the Middle.*

JG *What do you see as the reciprocal responsibilities of the system and schools in this process?*

MF The system frames goals, provides resources, and ensures that there is a data system re progress and outcomes (but does not micromanage). The schools develop 'internal accountability' (self and collective responsibility), interact with the outside (and with the system itself) to learn. It is a give-and-take proposition.

JG *Principals indicate that system support often ends up as an additional level of bureaucracy rather than as something which builds the capacity of principals to more*

effectively carry out an educational leadership role. What is an effective way for the system to support school leaders to enable school improvement?

MF This is a two way street. School leaders have to stop thinking that their role includes compliance - no need to be rebellious, but toeing the line is not a good job description. At the same time they need to increase their 'participation as a learner' activity with teachers. If they do both of these things they will become more empowered and appreciated by teachers and many system leaders alike. System leaders can help create such a system but it is more effective when it comes from the bottom upward and gets more embraced by system leaders.

JG There has been evidence from recent selection processes of a marked decline in the number of applicants for principal positions, even in what are regarded as highly desirable and high performing schools. What does the system need to do to attract and retain the best people to fill these leadership roles?

MF The principalship is actually becoming more important as systems go to what I might call 'coordinated decentralization'. I think we will see the principal's role highlighted both in terms of additional focus on student learning, but also re the development of the profession. What the system needs to do is show how the principal's role and the teaching profession are intertwined and need to develop in concert. In this way the principal's role will grow in stature.

JG What do school leaders have to do to sustain school improvement?

MF Focus on a small number of key priorities, and cultivate leadership in others paying simultaneous attention to current performance and building capacity beyond oneself to get what I called above: 'indelible leadership'.

JG What do you see as the role of professional learning communities in school improvement? Does their effectiveness depend on certain conditions and a particular model of operation?

MF See Fullan and Hargreaves *Bringing the Profession Back In* (Learning Forward, 2016). Professional learning communities are superficial failures when they involve getting together without a clear purpose and mechanism for strengthening capacity linked to improved teaching and student learning. Personally I don't use the label professional learning community (being content with the designation 'collaborative cultures'), but

if you are going to use it make sure it has the specific components associated with success.

JG *The digital environment has facilitated and elevated the role of data in schools and principals are being encouraged to take a data-driven approach to school improvement. What is your take on how schools and systems should use data?*

MF Big question and we just wrote a book about it: *Deep Learning: Engage the World Change the World* (Fullan, Quinn and McEachen, Corwin). It is actually a silly question when you think of it. If my goal is to be healthy it would be odd if I said I am not going to look at my health indicators. And if you become a slave to data you really don't have any steering capacity. So, get your moral purpose straight, build purposeful collaboration, improve teaching, focus on the causal pathway to student success, get or produce performance data, monitor how well you are doing, and take corrective action. We have a model to do this and it involves data and digital as 'accelerators' not drivers.

JG *Another big question to finish with: What do you mean when you write that: "Traditional schooling no longer works"? What are the implications of this?*

MF Two reasons: the push reason—traditional schooling is boring for the majority of students (as they go up the grade levels) and teachers. The pull reasons are a) that the digital world is dynamic and alluring, and b) the future of work and global competency requirements are unclear and volatile. With respect to implications, we are involved in working out some solutions with some countries. This involves new learning 'outcomes' – what we call the 6Cs; character, citizenship, collaboration, communication, creativity, and critical thinking. And new 'pedagogies': revamping teaching and learning, and altering learning environments.

Professional Voice

Back issues

The following back issues are still available, free to AEU members. Contact Marlene McLean marlene.mclean@aeuvic.asn.au indicating the volume, number, and title of the edition and your postal address.

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PV11.3: What works (and what doesn't)

This edition examines the evidence on the theory and practice that is working - or not working - in school and early childhood education.

PV 11.2: Teaching in context

This edition is about the conditions and context of teaching. The authors challenge some of the current "truths" about education such as the need for greater school autonomy and choice, the unimportance of class size, the unalloyed benefits for teachers of the new digital environment, the negligible need for mainstream gender diversity education and the quality of private schooling.

PV 11.1: School choice

The theme of the Autumn 2016 edition of Professional Voice is school choice. There are four articles directly related to the theme. Two of them describe and analyse research studies of school choice in Melbourne. The other two have an international flavour and investigate charter schools in America and academies in the UK.

PV 10.3: Teaching "teaching"

This edition's focus is initial teacher education. Three authors comment on the national (TEMAG) report into teacher education and give their views about how to improve the quality of pre-service education. There is also new evidence about the decline in equity in Australian schools.

PV 10.2 Public, Private and Edu-business

This edition looks at the relationship between the public and private education sectors and busts the myth that education offered in private schools is superior to that offered in public schools. We also examine the alarming rise of edu-business in Australia.

PV 10.1: Testing Times

From NAPLAN to PISA, tests have become a defining feature of global education systems. But how much do testing regimes really tell us about education systems and how much do they distort the very thing they report on?

PV 9.3: Global Education Reform Movement

With an editorial overview of the GERM agenda, stories include a look at NAPLAN and assessment, collaborative teaching, class sizes and the models of reform being pursued in America and the UK.

PV 9.2: School Improvement

This edition of Professional Voice moves away from the thematic approach we have used in the past and instead highlights quality writing that questions taken-for-granted ideas surrounding contemporary educational discourse.

PV 9.1: Equity and Disadvantage

This edition takes a look at equity issues. Alan Reid argues that governments have fallen in love with quick fixes. Alan Smithers notes that choice and standards policies in England failed to increase equity because they were not part of a well-designed system.

Professional learning

Editorial: Professional learning
John Graham

How can we foster professional learning?
Mary Kennedy

Fundamentals of student achievement
Stephen Dinham

The effects of inequity in Australian schools
Sue Thomson

Aboriginal and Torres Strait Islander teachers in Australian schools
Peter S. Johnson

Neurodevelopmental differentiation
Andrew Fuller and Vicki Hartley

The Shepparton Neighbourhood Schools Project
Peter Eastaugh, Kerri-Anne Souter, Jenny Manuel, Marian Wetherbee, Peta Van Popering and Donna Berry

Michael Fullan on public school improvement and the role of school leadership in that process
Interview by John Graham